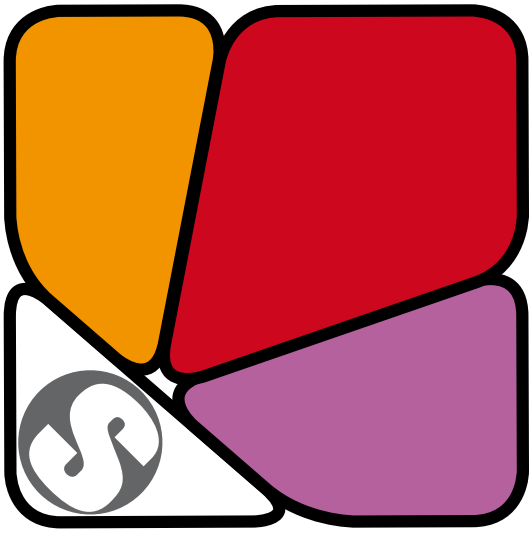


# The Parma Polyhedra Library Configured Java Language Interface User's Manual*

(version 1.0)

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# 1 Main Page

The Parma Polyhedra Library comes equipped with an interface for the Java language. The Java interface provides access to the numerical abstractions (convex polyhedra, BD shapes, octagonal shapes, etc.) implemented by the PPL library. A general introduction to the numerical abstractions, their representation in the PPL and the operations provided by the PPL is given in the main *PPL user manual*. Here we just describe those aspects that are specific to the Java interface. In the sequel, `prefix` is the path prefix under which the library has been installed (typically `/usr` or `/usr/local`).

### Overview

Here is a list of notes with general information and advice on the use of the Java interface.

- When the Parma Polyhedra Library is configured, it will automatically test for the existence of the Java system (unless configuration options are passed to disable the build of the Java interface; see configuration option `-enable-interfaces`). If Java is correctly installed in a standard location, things will be arranged so that the Java interface is built and installed (see configuration option `-with-java` if you need to specify a non-standard location for the Java system).

- The Java interface files are all installed in the directory `prefix/lib/ppl`. Since this includes shared and dynamically loaded libraries, you must make your dynamic linker/loader aware of this fact. If you use a GNU/Linux system, try the commands `man ld.so` and `man ldconfig` for more information.

- Any application using the PPL should:
  - Load the PPL interface library by calling `System.load` and passing the full path of the dynamic shared object;
  - Make sure that only the intended version(s) of the library has been loaded, e.g., by calling static method `version()` in class `parma_polyhedra_library.Parma_Polyhedra_Library`;
  - Starting from version 0.11, initialize the interface by calling static method `initialize_library()`; when all library work is done, finalize the interface by calling `finalize_library()`.

- The numerical abstract domains available to the Java user as Java classes consist of the *simple* domains, *powersets* of a simple domain and *products* of simple domains. Note that the default configuration will only enable a subset of these domains (if you need a different set of domains, see configuration option `-enable-instantiations`).
  - The simple domains are:
    - convex polyhedra, which consist of C_Polyhedron and NNC_Polyhedron;
    - weakly relational, which consist of BD_Shape_N and Octagonal_Shape_N where N is one of the numeric types signed_char, short, int, long, long_long, mpz_class, mpq_class;
    - boxes which consist of Int8_Box, Int16_Box, Int32_Box, Int64_Box, Uint8_Box, Uint16_Box, Uint32_Box, Uint64_Box, Float_Box, Double_Box, Long_Double_Box, Z_Box, Rational_Box; and
    - the Grid domain.
  - The powerset domains are Pointset_Powerset_S where S is a simple domain.
  - The product domains consist of Direct_Product_S_T, Smash_Product_S_T and Constraints_Product_S_T where S and T are simple domains.

- In the following, any of the above numerical abstract domains is called a PPL *domain* and any element of a PPL domain is called a *PPL object*.
- A Java program can create a new object for a PPL domain by using the constructors for the class corresponding to the domain.
- For a PPL object with space dimension `k`, the identifiers used for the PPL variables must lie between 0 and $k-1$ and correspond to the indices of the associated Cartesian axes. For example, when using methods that combine PPL polyhedra or add constraints or generators to a representation of a PPL polyhedron, the polyhedra referenced and any constraints or generators in the call should follow all the (space) dimension-compatibility rules stated in Section *Representations of Convex Polyhedra* of the main PPL user manual.
- As explained above, a polyhedron has a fixed topology C or NNC, that is determined at the time of its initialization. All subsequent operations on the polyhedron must respect all the topological compatibility rules stated in Section *Representations of Convex Polyhedra* of the main PPL user manual.

# 2 GNU General Public License

Version 3, 29 June 2007

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### 1. Source Code.

The "source code" for a work means the preferred form of the work for making modifications to it. "Object code" means any non-source form of a work.

A "Standard Interface" means an interface that either is an official standard defined by a recognized standards body, or, in the case of interfaces specified for a particular programming language, one that is widely used among developers working in that language.

The "System Libraries" of an executable work include anything, other than the work as a whole, that (a) is included in the normal form of packaging a Major Component, but which is not part of that Major

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# 8 Module Documentation

## 8.1 Java Language Interface

### Namespaces

- package parma_polyhedra_library

  *The PPL Java interface package.*

### Classes

- class parma_polyhedra_library.Artificial_Parameter_Sequence

  *A sequence of artificial parameters.*
- enum parma_polyhedra_library.Bounded_Integer_Type_Overflow

  *Overflow behavior of bounded integer types.*
- enum parma_polyhedra_library.Bounded_Integer_Type_Representation

  *Representation of bounded integer types.*
- enum parma_polyhedra_library.Bounded_Integer_Type_Width

  *Widths of bounded integer types.*
- class parma_polyhedra_library.By_Reference< T >

  *An utility class implementing mutable and non-mutable call-by-reference.*
- class parma_polyhedra_library.Coefficient

  *A PPL coefficient.*
- enum parma_polyhedra_library.Complexity_Class

  *Possible Complexities.*
- class parma_polyhedra_library.Congruence

  *A linear congruence.*
- class parma_polyhedra_library.Congruence_System

  *A system of congruences.*
- class parma_polyhedra_library.Constraint

  *A linear equality or inequality.*
- class parma_polyhedra_library.Constraint_System

  *A system of constraints.*
- enum parma_polyhedra_library.Control_Parameter_Name

  *Names of MIP problems' control parameters.*
- enum parma_polyhedra_library.Control_Parameter_Value

  *Possible values for MIP problem's control parameters.*
- enum parma_polyhedra_library.Degenerate_Element

  *Kinds of degenerate abstract elements.*
- class parma_polyhedra_library.Domain_Error_Exception

  *Exceptions caused by domain errors.*
- class parma_polyhedra_library.Generator

  *A line, ray, point or closure point.*
- class parma_polyhedra_library.Generator_System

  *A system of generators.*
- enum parma_polyhedra_library.Generator_Type

  *The generator type.*

- class parma_polyhedra_library.Grid_Generator

  *A grid line, parameter or grid point.*
- class parma_polyhedra_library.Grid_Generator_System

  *A system of grid generators.*
- enum parma_polyhedra_library.Grid_Generator_Type

  *The grid generator type.*
- class parma_polyhedra_library.Invalid_Argument_Exception

  *Exceptions caused by invalid arguments.*
- class parma_polyhedra_library.IO

  *A class collecting I/O functions.*
- class parma_polyhedra_library.Length_Error_Exception

  *Exceptions caused by too big length/size values.*
- class parma_polyhedra_library.Linear_Expression

  *A linear expression.*
- class parma_polyhedra_library.Linear_Expression_Coefficient

  *A linear expression built from a coefficient.*
- class parma_polyhedra_library.Linear_Expression_Difference

  *The difference of two linear expressions.*
- class parma_polyhedra_library.Linear_Expression_Sum

  *The sum of two linear expressions.*
- class parma_polyhedra_library.Linear_Expression_Times

  *The product of a linear expression and a coefficient.*
- class parma_polyhedra_library.Linear_Expression_Unary_Minus

  *The negation of a linear expression.*
- class parma_polyhedra_library.Linear_Expression_Variable

  *A linear expression built from a variable.*
- class parma_polyhedra_library.Logic_Error_Exception

  *Exceptions due to errors in low-level routines.*
- class parma_polyhedra_library.MIP_Problem

  *A Mixed Integer (linear) Programming problem.*
- enum parma_polyhedra_library.MIP_Problem_Status

  *Possible outcomes of the MIP_Problem solver.*
- enum parma_polyhedra_library.Optimization_Mode

  *Possible optimization modes.*
- class parma_polyhedra_library.Overflow_Error_Exception

  *Exceptions due to overflow errors.*
- class parma_polyhedra_library.Pair< K, V >

  *A pair of values of type K and V.*
- class parma_polyhedra_library.Parma_Polyhedra_Library

  *A class collecting library-level functions.*
- class parma_polyhedra_library.Partial_Function

  *A partial function on space dimension indices.*
- class parma_polyhedra_library.PIP_Problem

  *A Parametric Integer Programming problem.*
- enum parma_polyhedra_library.PIP_Problem_Control_Parameter_Name

  *Names of PIP problems' control parameters.*

- enum parma_polyhedra_library.PIP_Problem_Control_Parameter_Value

  *Possible values for PIP problems' control parameters.*
- enum parma_polyhedra_library.PIP_Problem_Status

  *Possible outcomes of the PIP_Problem solver.*
- class parma_polyhedra_library.Poly_Con_Relation

  *The relation between a polyhedron and a constraint.*
- enum parma_polyhedra_library.Relation_Symbol

  *Relation symbols.*
- class parma_polyhedra_library.Timeout_Exception

  *Exceptions caused by timeout expiring.*
- class parma_polyhedra_library.Variable

  *A dimension of the vector space.*

### 8.1.1 Detailed Description

The Parma Polyhedra Library comes equipped with an interface for the Java language.

# 9 Namespace Documentation

## 9.1 Package parma_polyhedra_library

The PPL Java interface package.

### Classes

- class Artificial_Parameter
- class Artificial_Parameter_Sequence

  *A sequence of artificial parameters.*
- enum Bounded_Integer_Type_Overflow

  *Overflow behavior of bounded integer types.*
- enum Bounded_Integer_Type_Representation

  *Representation of bounded integer types.*
- enum Bounded_Integer_Type_Width

  *Widths of bounded integer types.*
- class By_Reference< T >

  *An utility class implementing mutable and non-mutable call-by-reference.*
- class Coefficient

  *A PPL coefficient.*
- enum Complexity_Class

  *Possible Complexities.*
- class Congruence

  *A linear congruence.*
- class Congruence_System

  *A system of congruences.*
- class Constraint

  *A linear equality or inequality.*

- class Constraint_System

  *A system of constraints.*
- enum Control_Parameter_Name

  *Names of MIP problems' control parameters.*
- enum Control_Parameter_Value

  *Possible values for MIP problem's control parameters.*
- enum Degenerate_Element

  *Kinds of degenerate abstract elements.*
- class Domain_Error_Exception

  *Exceptions caused by domain errors.*
- class Generator

  *A line, ray, point or closure point.*
- class Generator_System

  *A system of generators.*
- enum Generator_Type

  *The generator type.*
- class Grid_Generator

  *A grid line, parameter or grid point.*
- class Grid_Generator_System

  *A system of grid generators.*
- enum Grid_Generator_Type

  *The grid generator type.*
- class Invalid_Argument_Exception

  *Exceptions caused by invalid arguments.*
- class IO

  *A class collecting I/O functions.*
- class Length_Error_Exception

  *Exceptions caused by too big length/size values.*
- class Linear_Expression

  *A linear expression.*
- class Linear_Expression_Coefficient

  *A linear expression built from a coefficient.*
- class Linear_Expression_Difference

  *The difference of two linear expressions.*
- class Linear_Expression_Sum

  *The sum of two linear expressions.*
- class Linear_Expression_Times

  *The product of a linear expression and a coefficient.*
- class Linear_Expression_Unary_Minus

  *The negation of a linear expression.*
- class Linear_Expression_Variable

  *A linear expression built from a variable.*
- class Logic_Error_Exception

  *Exceptions due to errors in low-level routines.*
- class MIP_Problem

  *A Mixed Integer (linear) Programming problem.*

- enum MIP_Problem_Status

  *Possible outcomes of the MIP_Problem solver.*
- enum Optimization_Mode

  *Possible optimization modes.*
- class Overflow_Error_Exception

  *Exceptions due to overflow errors.*
- class Pair< K, V >

  *A pair of values of type K and V.*
- class Parma_Polyhedra_Library

  *A class collecting library-level functions.*
- class Partial_Function

  *A partial function on space dimension indices.*
- class PIP_Decision_Node

  *An internal node of the PIP solution tree.*
- class PIP_Problem

  *A Parametric Integer Programming problem.*
- enum PIP_Problem_Control_Parameter_Name

  *Names of PIP problems' control parameters.*
- enum PIP_Problem_Control_Parameter_Value

  *Possible values for PIP problems' control parameters.*
- enum PIP_Problem_Status

  *Possible outcomes of the PIP_Problem solver.*
- class PIP_Solution_Node

  *A leaf node of the PIP solution tree.*
- class PIP_Tree_Node

  *A node of the PIP solution tree.*
- class Poly_Con_Relation

  *The relation between a polyhedron and a constraint.*
- class Poly_Gen_Relation

  *The relation between a polyhedron and a generator.*
- enum Relation_Symbol

  *Relation symbols.*
- class Timeout_Exception

  *Exceptions caused by timeout expiring.*
- class Variable

  *A dimension of the vector space.*
- class Variables_Set

  *A java.util.TreeSet of variables' indexes.*
- class BD_Shape_double

  *Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<double>*
- class BD_Shape_float

  *Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<float>*
- class BD_Shape_int16_t

  *Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<int16_t>*
- class BD_Shape_int32_t

  *Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<int32_t>*

- class BD_Shape_int64_t

  *Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<int64_t>*
- class BD_Shape_int8_t

  *Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<int8_t>*
- class BD_Shape_long_double

  *Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<long double>*
- class BD_Shape_mpq_class

  *Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<mpq_class>*
- class BD_Shape_mpz_class

  *Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<mpz_class>*
- class C_Polyhedron

  *Java class interfacing C++ Parma_Polyhedra_Library::C_Polyhedron.*
- class Constraints_Product_C_Polyhedron_Grid

  *Java class interfacing C++ Parma_Polyhedra_Library::Constraints_Product<C_Polyhedron,Grid>*
- class Constraints_Product_Grid_C_Polyhedron

  *Java class interfacing C++ Parma_Polyhedra_Library::Constraints_Product<Grid,C_Polyhedron>*
- class Constraints_Product_Grid_NNC_Polyhedron

  *Java class interfacing C++ Parma_Polyhedra_Library::Constraints_Product<Grid,NNC_Polyhedron>*
- class Constraints_Product_NNC_Polyhedron_Grid

  *Java class interfacing C++ Parma_Polyhedra_Library::Constraints_Product<NNC_Polyhedron,Grid>*
- class Double_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Double_Box.*
- class Float_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Float_Box.*
- class Grid

  *Java class interfacing C++ Parma_Polyhedra_Library::Grid.*
- class Int16_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Int16_Box.*
- class Int32_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Int32_Box.*
- class Int64_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Int64_Box.*
- class Int8_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Int8_Box.*
- class Long_Double_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Long_Double_Box.*
- class NNC_Polyhedron

  *Java class interfacing C++ Parma_Polyhedra_Library::NNC_Polyhedron.*
- class Octagonal_Shape_double

  *Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<double>*
- class Octagonal_Shape_float

  *Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<float>*
- class Octagonal_Shape_int16_t

  *Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<int16_t>*
- class Octagonal_Shape_int32_t

  *Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<int32_t>*

- class Octagonal_Shape_int64_t

  *Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<int64_t>*
- class Octagonal_Shape_int8_t

  *Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<int8_t>*
- class Octagonal_Shape_long_double

  *Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<long double>*
- class Octagonal_Shape_mpq_class

  *Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<mpq_class>*
- class Octagonal_Shape_mpz_class

  *Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<mpz_class>*
- class Pointset_Powerset_BD_Shape_double

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<double> >*
- class Pointset_Powerset_BD_Shape_double_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<double> >:: iterator.*
- class Pointset_Powerset_BD_Shape_float

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<float> >*
- class Pointset_Powerset_BD_Shape_float_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<float> >:: iterator.*
- class Pointset_Powerset_BD_Shape_int16_t

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int16_t> >*
- class Pointset_Powerset_BD_Shape_int16_t_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int16_t> >:: iterator.*
- class Pointset_Powerset_BD_Shape_int32_t

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int32_t> >*
- class Pointset_Powerset_BD_Shape_int32_t_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int32_t> >:: iterator.*
- class Pointset_Powerset_BD_Shape_int64_t

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int64_t> >*
- class Pointset_Powerset_BD_Shape_int64_t_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int64_t> >:: iterator.*
- class Pointset_Powerset_BD_Shape_int8_t

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int8_t> >*
- class Pointset_Powerset_BD_Shape_int8_t_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int8_t> >:: iterator.*
- class Pointset_Powerset_BD_Shape_long_double

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<long double> >*
- class Pointset_Powerset_BD_Shape_long_double_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<long double> >:: iterator.*
- class Pointset_Powerset_BD_Shape_mpq_class

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<mpq_class> >*
- class Pointset_Powerset_BD_Shape_mpq_class_Iterator

*Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<mpq_class> >:: iterator.*

- class Pointset_Powerset_BD_Shape_mpz_class

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<mpz_class> >*
- class Pointset_Powerset_BD_Shape_mpz_class_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<mpz_class> >:: iterator.*
- class Pointset_Powerset_C_Polyhedron

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<C_Polyhedron>*
- class Pointset_Powerset_C_Polyhedron_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<C_Polyhedron>:: iterator.*
- class Pointset_Powerset_Double_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Double_Box>*
- class Pointset_Powerset_Double_Box_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Double_Box>:: iterator.*
- class Pointset_Powerset_Float_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Float_Box>*
- class Pointset_Powerset_Float_Box_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Float_Box>:: iterator.*
- class Pointset_Powerset_Grid

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Grid>*
- class Pointset_Powerset_Grid_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Grid>:: iterator.*
- class Pointset_Powerset_Int16_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int16_Box>*
- class Pointset_Powerset_Int16_Box_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int16_Box>:: iterator.*
- class Pointset_Powerset_Int32_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int32_Box>*
- class Pointset_Powerset_Int32_Box_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int32_Box>:: iterator.*
- class Pointset_Powerset_Int64_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int64_Box>*
- class Pointset_Powerset_Int64_Box_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int64_Box>:: iterator.*
- class Pointset_Powerset_Int8_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int8_Box>*
- class Pointset_Powerset_Int8_Box_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int8_Box>:: iterator.*
- class Pointset_Powerset_Long_Double_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Long_Double_Box>*
- class Pointset_Powerset_Long_Double_Box_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Long_Double_Box>:: iterator.*
- class Pointset_Powerset_NNC_Polyhedron

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<NNC_Polyhedron>*
- class Pointset_Powerset_NNC_Polyhedron_Iterator

*Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<NNC_Polyhedron>:: iterator.*

- class Pointset_Powerset_Octagonal_Shape_double

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<double> >*
- class Pointset_Powerset_Octagonal_Shape_double_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<double> >:: iterator.*
- class Pointset_Powerset_Octagonal_Shape_float

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<float> >*
- class Pointset_Powerset_Octagonal_Shape_float_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<float> >:: iterator.*
- class Pointset_Powerset_Octagonal_Shape_int16_t

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int16_t> >*
- class Pointset_Powerset_Octagonal_Shape_int16_t_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int16_t> >:: iterator.*
- class Pointset_Powerset_Octagonal_Shape_int32_t

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int32_t> >*
- class Pointset_Powerset_Octagonal_Shape_int32_t_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int32_t> >:: iterator.*
- class Pointset_Powerset_Octagonal_Shape_int64_t

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int64_t> >*
- class Pointset_Powerset_Octagonal_Shape_int64_t_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int64_t> >:: iterator.*
- class Pointset_Powerset_Octagonal_Shape_int8_t

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int8_t> >*
- class Pointset_Powerset_Octagonal_Shape_int8_t_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int8_t> >:: iterator.*
- class Pointset_Powerset_Octagonal_Shape_long_double

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<long double> >*
- class Pointset_Powerset_Octagonal_Shape_long_double_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<long double> >:: iterator.*
- class Pointset_Powerset_Octagonal_Shape_mpq_class

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<mpq_class> >*
- class Pointset_Powerset_Octagonal_Shape_mpq_class_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<mpq_class> >:: iterator.*
- class Pointset_Powerset_Octagonal_Shape_mpz_class

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<mpz_class> >*

- class Pointset_Powerset_Octagonal_Shape_mpz_class_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<mpz_class> >:: iterator.*
- class Pointset_Powerset_Rational_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Rational_Box>*
- class Pointset_Powerset_Rational_Box_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Rational_Box>:: iterator.*
- class Pointset_Powerset_Uint16_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint16_Box>*
- class Pointset_Powerset_Uint16_Box_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint16_Box>:: iterator.*
- class Pointset_Powerset_Uint32_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint32_Box>*
- class Pointset_Powerset_Uint32_Box_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint32_Box>:: iterator.*
- class Pointset_Powerset_Uint64_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint64_Box>*
- class Pointset_Powerset_Uint64_Box_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint64_Box>:: iterator.*
- class Pointset_Powerset_Uint8_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint8_Box>*
- class Pointset_Powerset_Uint8_Box_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint8_Box>:: iterator.*
- class Pointset_Powerset_Z_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Z_Box>*
- class Pointset_Powerset_Z_Box_Iterator

  *Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Z_Box>:: iterator.*
- class Polyhedron

  *Java class interfacing C++ Parma_Polyhedra_Library::Polyhedron.*
- class Rational_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Rational_Box.*
- class Uint16_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Uint16_Box.*
- class Uint32_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Uint32_Box.*
- class Uint64_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Uint64_Box.*
- class Uint8_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Uint8_Box.*
- class Z_Box

  *Java class interfacing C++ Parma_Polyhedra_Library::Z_Box.*

### 9.1.1 Detailed Description

The PPL Java interface package. All classes, interfaces and enums related to the Parma Polyhedra Library Java interface are included in this package.

# 10 Class Documentation

## 10.1 parma_polyhedra_library.Artificial_Parameter Class Reference

### Public Member Functions

- Artificial_Parameter (Linear_Expression e, Coefficient d)

  *Builds an artificial parameter from a linear expression and a denominator.*
- Linear_Expression linear_expression ()

  *Returns the linear expression in artificial parameter* `this`.
- Coefficient denominator ()

  *Returns the denominator in artificial parameter* `this`.
- native String ascii_dump ()

  *Returns an ascii formatted internal representation of* `this`.
- native String toString ()

  *Returns a string representation of* `this`.

### 10.1.1 Detailed Description

An Artificial_Parameter object represents the result of the integer division of a Linear_Expression (on the other parameters, including the previously-defined artificials) by an integer denominator (a Coefficient object). The dimensions of the artificial parameters (if any) in a tree node have consecutive indices starting from `dim+1`, where the value of `dim` is computed as follows:

- for the tree root node, `dim` is the space dimension of the PIP_Problem;
- for any other node of the tree, it is recusrively obtained by adding the value of `dim` computed for the parent node to the number of artificial parameters defined in the parent node.

> Since the numbering of dimensions for artificial parameters follows the rule above, the addition of new problem variables and/or new problem parameters to an already solved PIP_Problem object (as done when incrementally solving a problem) will result in the systematic renumbering of all the existing artificial parameters.

The documentation for this class was generated from the following file:

- Artificial_Parameter.java

## 10.2 parma_polyhedra_library.Artificial_Parameter_Sequence Class Reference

A sequence of artificial parameters.

### Public Member Functions

- Artificial_Parameter_Sequence ()

  *Default constructor: builds an empty sequence of artificial parameters.*

### 10.2.1 Detailed Description

A sequence of artificial parameters.

An object of the class Artificial_Parameter_Sequence is a sequence of artificial parameters.

The documentation for this class was generated from the following file:

- Artificial_Parameter_Sequence.java

## 10.3 parma_polyhedra_library.BD_Shape_double Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<double>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **BD_Shape_double** (long num_dimensions, Degenerate_Element kind)
- **BD_Shape_double** (Int8_Box y)
- **BD_Shape_double** (Int16_Box y)
- **BD_Shape_double** (Int32_Box y)
- **BD_Shape_double** (Int64_Box y)
- **BD_Shape_double** (Uint8_Box y)
- **BD_Shape_double** (Uint16_Box y)
- **BD_Shape_double** (Uint32_Box y)
- **BD_Shape_double** (Uint64_Box y)
- **BD_Shape_double** (Z_Box y)
- **BD_Shape_double** (Rational_Box y)
- **BD_Shape_double** (BD_Shape_int8_t y)
- **BD_Shape_double** (BD_Shape_int16_t y)
- **BD_Shape_double** (BD_Shape_int32_t y)
- **BD_Shape_double** (BD_Shape_int64_t y)
- **BD_Shape_double** (BD_Shape_mpz_class y)
- **BD_Shape_double** (BD_Shape_mpq_class y)
- **BD_Shape_double** (Octagonal_Shape_int8_t y)
- **BD_Shape_double** (Octagonal_Shape_int16_t y)
- **BD_Shape_double** (Octagonal_Shape_int32_t y)
- **BD_Shape_double** (Octagonal_Shape_int64_t y)
- **BD_Shape_double** (Octagonal_Shape_mpz_class y)
- **BD_Shape_double** (Octagonal_Shape_mpq_class y)
- **BD_Shape_double** (C_Polyhedron y)
- **BD_Shape_double** (NNC_Polyhedron y)
- **BD_Shape_double** (Grid y)
- **BD_Shape_double** (Float_Box y)
- **BD_Shape_double** (BD_Shape_float y)
- **BD_Shape_double** (Octagonal_Shape_float y)
- **BD_Shape_double** (Double_Box y)
- **BD_Shape_double** (BD_Shape_double y)
- **BD_Shape_double** (Octagonal_Shape_double y)
- **BD_Shape_double** (Long_Double_Box y)

- **BD_Shape_double** (BD_Shape_long_double y)
- **BD_Shape_double** (Octagonal_Shape_long_double y)
- **BD_Shape_double** (Int8_Box y, Complexity_Class complexity)
- **BD_Shape_double** (Int16_Box y, Complexity_Class complexity)
- **BD_Shape_double** (Int32_Box y, Complexity_Class complexity)
- **BD_Shape_double** (Int64_Box y, Complexity_Class complexity)
- **BD_Shape_double** (Uint8_Box y, Complexity_Class complexity)
- **BD_Shape_double** (Uint16_Box y, Complexity_Class complexity)
- **BD_Shape_double** (Uint32_Box y, Complexity_Class complexity)
- **BD_Shape_double** (Uint64_Box y, Complexity_Class complexity)
- **BD_Shape_double** (Z_Box y, Complexity_Class complexity)
- **BD_Shape_double** (Rational_Box y, Complexity_Class complexity)
- **BD_Shape_double** (BD_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_double** (BD_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_double** (BD_Shape_int32_t y, Complexity_Class complexity)
- **BD_Shape_double** (BD_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_double** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_double** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_double** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_double** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_double** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **BD_Shape_double** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_double** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_double** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_double** (C_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_double** (NNC_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_double** (Grid y, Complexity_Class complexity)
- **BD_Shape_double** (Float_Box y, Complexity_Class complexity)
- **BD_Shape_double** (BD_Shape_float y, Complexity_Class complexity)
- **BD_Shape_double** (Octagonal_Shape_float y, Complexity_Class complexity)
- **BD_Shape_double** (Double_Box y, Complexity_Class complexity)
- **BD_Shape_double** (BD_Shape_double y, Complexity_Class complexity)
- **BD_Shape_double** (Octagonal_Shape_double y, Complexity_Class complexity)
- **BD_Shape_double** (Long_Double_Box y, Complexity_Class complexity)
- **BD_Shape_double** (BD_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_double** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_double** (Constraint_System cs)
- **BD_Shape_double** (Congruence_System cs)
- **BD_Shape_double** (Generator_System cs)
- native void **swap** (BD_Shape_double y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()

- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (BD_Shape_double y)
- native boolean **strictly_contains** (BD_Shape_double y)
- native boolean **is_disjoint_from** (BD_Shape_double y)
- native boolean **equals** (BD_Shape_double p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (BD_Shape_double p)
- native void **upper_bound_assign** (BD_Shape_double p)
- native void **difference_assign** (BD_Shape_double p)
- native void **concatenate_assign** (BD_Shape_double p)
- native void **time_elapse_assign** (BD_Shape_double p)
- native boolean **upper_bound_assign_if_exact** (BD_Shape_double y)
- native boolean **simplify_using_context_assign** (BD_Shape_double p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)

- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (BD_Shape_double y, By_Reference< Integer > tp)
- native void **H79_widening_assign** (BD_Shape_double y, By_Reference< Integer > tp)
- native void **widening_assign** (BD_Shape_double y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (BD_Shape_double y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_H79_extrapolation_assign** (BD_Shape_double y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (BD_Shape_double y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (BD_Shape_double arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (BD_Shape_double arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Static Public Member Functions

- static native Pair < BD_Shape_double, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (BD_Shape_double p, BD_Shape_double q)

### Protected Member Functions

- native void **finalize** ()

### 10.3.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<double>

The documentation for this class was generated from the following file:

- BD_Shape_double.java

## 10.4 parma_polyhedra_library.BD_Shape_float Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<float>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **BD_Shape_float** (long num_dimensions, Degenerate_Element kind)
- **BD_Shape_float** (Int8_Box y)
- **BD_Shape_float** (Int16_Box y)
- **BD_Shape_float** (Int32_Box y)
- **BD_Shape_float** (Int64_Box y)
- **BD_Shape_float** (Uint8_Box y)
- **BD_Shape_float** (Uint16_Box y)
- **BD_Shape_float** (Uint32_Box y)
- **BD_Shape_float** (Uint64_Box y)
- **BD_Shape_float** (Z_Box y)
- **BD_Shape_float** (Rational_Box y)
- **BD_Shape_float** (BD_Shape_int8_t y)
- **BD_Shape_float** (BD_Shape_int16_t y)
- **BD_Shape_float** (BD_Shape_int32_t y)
- **BD_Shape_float** (BD_Shape_int64_t y)
- **BD_Shape_float** (BD_Shape_mpz_class y)
- **BD_Shape_float** (BD_Shape_mpq_class y)
- **BD_Shape_float** (Octagonal_Shape_int8_t y)
- **BD_Shape_float** (Octagonal_Shape_int16_t y)
- **BD_Shape_float** (Octagonal_Shape_int32_t y)
- **BD_Shape_float** (Octagonal_Shape_int64_t y)
- **BD_Shape_float** (Octagonal_Shape_mpz_class y)
- **BD_Shape_float** (Octagonal_Shape_mpq_class y)
- **BD_Shape_float** (C_Polyhedron y)
- **BD_Shape_float** (NNC_Polyhedron y)
- **BD_Shape_float** (Grid y)
- **BD_Shape_float** (Float_Box y)
- **BD_Shape_float** (BD_Shape_float y)
- **BD_Shape_float** (Octagonal_Shape_float y)
- **BD_Shape_float** (Double_Box y)
- **BD_Shape_float** (BD_Shape_double y)
- **BD_Shape_float** (Octagonal_Shape_double y)
- **BD_Shape_float** (Long_Double_Box y)
- **BD_Shape_float** (BD_Shape_long_double y)
- **BD_Shape_float** (Octagonal_Shape_long_double y)

- **BD_Shape_float** (Int8_Box y, Complexity_Class complexity)
- **BD_Shape_float** (Int16_Box y, Complexity_Class complexity)
- **BD_Shape_float** (Int32_Box y, Complexity_Class complexity)
- **BD_Shape_float** (Int64_Box y, Complexity_Class complexity)
- **BD_Shape_float** (Uint8_Box y, Complexity_Class complexity)
- **BD_Shape_float** (Uint16_Box y, Complexity_Class complexity)
- **BD_Shape_float** (Uint32_Box y, Complexity_Class complexity)
- **BD_Shape_float** (Uint64_Box y, Complexity_Class complexity)
- **BD_Shape_float** (Z_Box y, Complexity_Class complexity)
- **BD_Shape_float** (Rational_Box y, Complexity_Class complexity)
- **BD_Shape_float** (BD_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_float** (BD_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_float** (BD_Shape_int32_t y, Complexity_Class complexity)
- **BD_Shape_float** (BD_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_float** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_float** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_float** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_float** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_float** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **BD_Shape_float** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_float** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_float** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_float** (C_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_float** (NNC_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_float** (Grid y, Complexity_Class complexity)
- **BD_Shape_float** (Float_Box y, Complexity_Class complexity)
- **BD_Shape_float** (BD_Shape_float y, Complexity_Class complexity)
- **BD_Shape_float** (Octagonal_Shape_float y, Complexity_Class complexity)
- **BD_Shape_float** (Double_Box y, Complexity_Class complexity)
- **BD_Shape_float** (BD_Shape_double y, Complexity_Class complexity)
- **BD_Shape_float** (Octagonal_Shape_double y, Complexity_Class complexity)
- **BD_Shape_float** (Long_Double_Box y, Complexity_Class complexity)
- **BD_Shape_float** (BD_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_float** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_float** (Constraint_System cs)
- **BD_Shape_float** (Congruence_System cs)
- **BD_Shape_float** (Generator_System cs)
- native void **swap** (BD_Shape_float y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()

- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (BD_Shape_float y)
- native boolean **strictly_contains** (BD_Shape_float y)
- native boolean **is_disjoint_from** (BD_Shape_float y)
- native boolean **equals** (BD_Shape_float p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (BD_Shape_float p)
- native void **upper_bound_assign** (BD_Shape_float p)
- native void **difference_assign** (BD_Shape_float p)
- native void **concatenate_assign** (BD_Shape_float p)
- native void **time_elapse_assign** (BD_Shape_float p)
- native boolean **upper_bound_assign_if_exact** (BD_Shape_float y)
- native boolean **simplify_using_context_assign** (BD_Shape_float p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)

- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (BD_Shape_float y, By_Reference< Integer > tp)
- native void **H79_widening_assign** (BD_Shape_float y, By_Reference< Integer > tp)
- native void **widening_assign** (BD_Shape_float y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (BD_Shape_float y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_H79_extrapolation_assign** (BD_Shape_float y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (BD_Shape_float y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (BD_Shape_float arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (BD_Shape_float arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Static Public Member Functions

- static native Pair < BD_Shape_float, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (BD_Shape_float p, BD_Shape_float q)

### Protected Member Functions

- native void **finalize** ()

### 10.4.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<float>

The documentation for this class was generated from the following file:

- BD_Shape_float.java

## 10.5 parma_polyhedra_library.BD_Shape_int16_t Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<int16_t>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **BD_Shape_int16_t** (long num_dimensions, Degenerate_Element kind)
- **BD_Shape_int16_t** (Int8_Box y)
- **BD_Shape_int16_t** (Int16_Box y)
- **BD_Shape_int16_t** (Int32_Box y)
- **BD_Shape_int16_t** (Int64_Box y)
- **BD_Shape_int16_t** (Uint8_Box y)
- **BD_Shape_int16_t** (Uint16_Box y)
- **BD_Shape_int16_t** (Uint32_Box y)
- **BD_Shape_int16_t** (Uint64_Box y)
- **BD_Shape_int16_t** (Z_Box y)
- **BD_Shape_int16_t** (Rational_Box y)
- **BD_Shape_int16_t** (BD_Shape_int8_t y)
- **BD_Shape_int16_t** (BD_Shape_int16_t y)
- **BD_Shape_int16_t** (BD_Shape_int32_t y)
- **BD_Shape_int16_t** (BD_Shape_int64_t y)
- **BD_Shape_int16_t** (BD_Shape_mpz_class y)
- **BD_Shape_int16_t** (BD_Shape_mpq_class y)
- **BD_Shape_int16_t** (Octagonal_Shape_int8_t y)
- **BD_Shape_int16_t** (Octagonal_Shape_int16_t y)
- **BD_Shape_int16_t** (Octagonal_Shape_int32_t y)
- **BD_Shape_int16_t** (Octagonal_Shape_int64_t y)
- **BD_Shape_int16_t** (Octagonal_Shape_mpz_class y)
- **BD_Shape_int16_t** (Octagonal_Shape_mpq_class y)
- **BD_Shape_int16_t** (C_Polyhedron y)
- **BD_Shape_int16_t** (NNC_Polyhedron y)
- **BD_Shape_int16_t** (Grid y)
- **BD_Shape_int16_t** (Float_Box y)
- **BD_Shape_int16_t** (BD_Shape_float y)
- **BD_Shape_int16_t** (Octagonal_Shape_float y)
- **BD_Shape_int16_t** (Double_Box y)
- **BD_Shape_int16_t** (BD_Shape_double y)
- **BD_Shape_int16_t** (Octagonal_Shape_double y)
- **BD_Shape_int16_t** (Long_Double_Box y)
- **BD_Shape_int16_t** (BD_Shape_long_double y)
- **BD_Shape_int16_t** (Octagonal_Shape_long_double y)
- **BD_Shape_int16_t** (Int8_Box y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Int16_Box y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Int32_Box y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Int64_Box y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Uint8_Box y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Uint16_Box y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Uint32_Box y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Uint64_Box y, Complexity_Class complexity)

- **BD_Shape_int16_t** (Z_Box y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Rational_Box y, Complexity_Class complexity)
- **BD_Shape_int16_t** (BD_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_int16_t** (BD_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_int16_t** (BD_Shape_int32_t y, Complexity_Class complexity)
- **BD_Shape_int16_t** (BD_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_int16_t** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_int16_t** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_int16_t** (C_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_int16_t** (NNC_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Grid y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Float_Box y, Complexity_Class complexity)
- **BD_Shape_int16_t** (BD_Shape_float y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Octagonal_Shape_float y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Double_Box y, Complexity_Class complexity)
- **BD_Shape_int16_t** (BD_Shape_double y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Octagonal_Shape_double y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Long_Double_Box y, Complexity_Class complexity)
- **BD_Shape_int16_t** (BD_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_int16_t** (Constraint_System cs)
- **BD_Shape_int16_t** (Congruence_System cs)
- **BD_Shape_int16_t** (Generator_System cs)
- native void **swap** (BD_Shape_int16_t y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)

- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (BD_Shape_int16_t y)
- native boolean **strictly_contains** (BD_Shape_int16_t y)
- native boolean **is_disjoint_from** (BD_Shape_int16_t y)
- native boolean **equals** (BD_Shape_int16_t p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (BD_Shape_int16_t p)
- native void **upper_bound_assign** (BD_Shape_int16_t p)
- native void **difference_assign** (BD_Shape_int16_t p)
- native void **concatenate_assign** (BD_Shape_int16_t p)
- native void **time_elapse_assign** (BD_Shape_int16_t p)
- native boolean **upper_bound_assign_if_exact** (BD_Shape_int16_t y)
- native boolean **simplify_using_context_assign** (BD_Shape_int16_t p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)

- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (BD_Shape_int16_t y, By_Reference< Integer > tp)
- native void **H79_widening_assign** (BD_Shape_int16_t y, By_Reference< Integer > tp)
- native void **widening_assign** (BD_Shape_int16_t y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (BD_Shape_int16_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_H79_extrapolation_assign** (BD_Shape_int16_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (BD_Shape_int16_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (BD_Shape_int16_t arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (BD_Shape_int16_t arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair < BD_Shape_int16_t, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (BD_Shape_int16_t p, BD_Shape_int16_t q)

#### Protected Member Functions

- native void **finalize** ()

### 10.5.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<int16_t>

The documentation for this class was generated from the following file:

- BD_Shape_int16_t.java

## 10.6 parma_polyhedra_library.BD_Shape_int32_t Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<int32_t>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **BD_Shape_int32_t** (long num_dimensions, Degenerate_Element kind)
- **BD_Shape_int32_t** (Int8_Box y)
- **BD_Shape_int32_t** (Int16_Box y)
- **BD_Shape_int32_t** (Int32_Box y)
- **BD_Shape_int32_t** (Int64_Box y)
- **BD_Shape_int32_t** (Uint8_Box y)
- **BD_Shape_int32_t** (Uint16_Box y)
- **BD_Shape_int32_t** (Uint32_Box y)
- **BD_Shape_int32_t** (Uint64_Box y)
- **BD_Shape_int32_t** (Z_Box y)
- **BD_Shape_int32_t** (Rational_Box y)
- **BD_Shape_int32_t** (BD_Shape_int8_t y)
- **BD_Shape_int32_t** (BD_Shape_int16_t y)
- **BD_Shape_int32_t** (BD_Shape_int32_t y)
- **BD_Shape_int32_t** (BD_Shape_int64_t y)
- **BD_Shape_int32_t** (BD_Shape_mpz_class y)
- **BD_Shape_int32_t** (BD_Shape_mpq_class y)
- **BD_Shape_int32_t** (Octagonal_Shape_int8_t y)
- **BD_Shape_int32_t** (Octagonal_Shape_int16_t y)
- **BD_Shape_int32_t** (Octagonal_Shape_int32_t y)
- **BD_Shape_int32_t** (Octagonal_Shape_int64_t y)
- **BD_Shape_int32_t** (Octagonal_Shape_mpz_class y)
- **BD_Shape_int32_t** (Octagonal_Shape_mpq_class y)
- **BD_Shape_int32_t** (C_Polyhedron y)
- **BD_Shape_int32_t** (NNC_Polyhedron y)
- **BD_Shape_int32_t** (Grid y)
- **BD_Shape_int32_t** (Float_Box y)
- **BD_Shape_int32_t** (BD_Shape_float y)
- **BD_Shape_int32_t** (Octagonal_Shape_float y)
- **BD_Shape_int32_t** (Double_Box y)
- **BD_Shape_int32_t** (BD_Shape_double y)
- **BD_Shape_int32_t** (Octagonal_Shape_double y)
- **BD_Shape_int32_t** (Long_Double_Box y)
- **BD_Shape_int32_t** (BD_Shape_long_double y)
- **BD_Shape_int32_t** (Octagonal_Shape_long_double y)
- **BD_Shape_int32_t** (Int8_Box y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Int16_Box y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Int32_Box y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Int64_Box y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Uint8_Box y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Uint16_Box y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Uint32_Box y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Uint64_Box y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Z_Box y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Rational_Box y, Complexity_Class complexity)
- **BD_Shape_int32_t** (BD_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_int32_t** (BD_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_int32_t** (BD_Shape_int32_t y, Complexity_Class complexity)

- **BD_Shape_int32_t** (BD_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_int32_t** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_int32_t** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_int32_t** (C_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_int32_t** (NNC_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Grid y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Float_Box y, Complexity_Class complexity)
- **BD_Shape_int32_t** (BD_Shape_float y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Octagonal_Shape_float y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Double_Box y, Complexity_Class complexity)
- **BD_Shape_int32_t** (BD_Shape_double y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Octagonal_Shape_double y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Long_Double_Box y, Complexity_Class complexity)
- **BD_Shape_int32_t** (BD_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_int32_t** (Constraint_System cs)
- **BD_Shape_int32_t** (Congruence_System cs)
- **BD_Shape_int32_t** (Generator_System cs)
- native void **swap** (BD_Shape_int32_t y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)

- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (BD_Shape_int32_t y)
- native boolean **strictly_contains** (BD_Shape_int32_t y)
- native boolean **is_disjoint_from** (BD_Shape_int32_t y)
- native boolean **equals** (BD_Shape_int32_t p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (BD_Shape_int32_t p)
- native void **upper_bound_assign** (BD_Shape_int32_t p)
- native void **difference_assign** (BD_Shape_int32_t p)
- native void **concatenate_assign** (BD_Shape_int32_t p)
- native void **time_elapse_assign** (BD_Shape_int32_t p)
- native boolean **upper_bound_assign_if_exact** (BD_Shape_int32_t y)
- native boolean **simplify_using_context_assign** (BD_Shape_int32_t p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)

- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (BD_Shape_int32_t y, By_Reference< Integer > tp)
- native void **H79_widening_assign** (BD_Shape_int32_t y, By_Reference< Integer > tp)
- native void **widening_assign** (BD_Shape_int32_t y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (BD_Shape_int32_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_H79_extrapolation_assign** (BD_Shape_int32_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (BD_Shape_int32_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (BD_Shape_int32_t arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (BD_Shape_int32_t arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair < BD_Shape_int32_t, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (BD_Shape_int32_t p, BD_Shape_int32_t q)

#### Protected Member Functions

- native void **finalize** ()

### 10.6.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<int32_t>

The documentation for this class was generated from the following file:

- BD_Shape_int32_t.java

## 10.7 parma_polyhedra_library.BD_Shape_int64_t Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<int64_t>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **BD_Shape_int64_t** (long num_dimensions, Degenerate_Element kind)
- **BD_Shape_int64_t** (Int8_Box y)
- **BD_Shape_int64_t** (Int16_Box y)
- **BD_Shape_int64_t** (Int32_Box y)
- **BD_Shape_int64_t** (Int64_Box y)
- **BD_Shape_int64_t** (Uint8_Box y)
- **BD_Shape_int64_t** (Uint16_Box y)
- **BD_Shape_int64_t** (Uint32_Box y)
- **BD_Shape_int64_t** (Uint64_Box y)
- **BD_Shape_int64_t** (Z_Box y)
- **BD_Shape_int64_t** (Rational_Box y)
- **BD_Shape_int64_t** (BD_Shape_int8_t y)
- **BD_Shape_int64_t** (BD_Shape_int16_t y)
- **BD_Shape_int64_t** (BD_Shape_int32_t y)
- **BD_Shape_int64_t** (BD_Shape_int64_t y)
- **BD_Shape_int64_t** (BD_Shape_mpz_class y)
- **BD_Shape_int64_t** (BD_Shape_mpq_class y)
- **BD_Shape_int64_t** (Octagonal_Shape_int8_t y)
- **BD_Shape_int64_t** (Octagonal_Shape_int16_t y)
- **BD_Shape_int64_t** (Octagonal_Shape_int32_t y)
- **BD_Shape_int64_t** (Octagonal_Shape_int64_t y)
- **BD_Shape_int64_t** (Octagonal_Shape_mpz_class y)
- **BD_Shape_int64_t** (Octagonal_Shape_mpq_class y)
- **BD_Shape_int64_t** (C_Polyhedron y)
- **BD_Shape_int64_t** (NNC_Polyhedron y)
- **BD_Shape_int64_t** (Grid y)
- **BD_Shape_int64_t** (Float_Box y)
- **BD_Shape_int64_t** (BD_Shape_float y)
- **BD_Shape_int64_t** (Octagonal_Shape_float y)
- **BD_Shape_int64_t** (Double_Box y)
- **BD_Shape_int64_t** (BD_Shape_double y)
- **BD_Shape_int64_t** (Octagonal_Shape_double y)
- **BD_Shape_int64_t** (Long_Double_Box y)
- **BD_Shape_int64_t** (BD_Shape_long_double y)
- **BD_Shape_int64_t** (Octagonal_Shape_long_double y)
- **BD_Shape_int64_t** (Int8_Box y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Int16_Box y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Int32_Box y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Int64_Box y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Uint8_Box y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Uint16_Box y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Uint32_Box y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Uint64_Box y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Z_Box y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Rational_Box y, Complexity_Class complexity)
- **BD_Shape_int64_t** (BD_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_int64_t** (BD_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_int64_t** (BD_Shape_int32_t y, Complexity_Class complexity)

- **BD_Shape_int64_t** (BD_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_int64_t** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_int64_t** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_int64_t** (C_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_int64_t** (NNC_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Grid y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Float_Box y, Complexity_Class complexity)
- **BD_Shape_int64_t** (BD_Shape_float y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Octagonal_Shape_float y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Double_Box y, Complexity_Class complexity)
- **BD_Shape_int64_t** (BD_Shape_double y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Octagonal_Shape_double y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Long_Double_Box y, Complexity_Class complexity)
- **BD_Shape_int64_t** (BD_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_int64_t** (Constraint_System cs)
- **BD_Shape_int64_t** (Congruence_System cs)
- **BD_Shape_int64_t** (Generator_System cs)
- native void **swap** (BD_Shape_int64_t y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)

- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (BD_Shape_int64_t y)
- native boolean **strictly_contains** (BD_Shape_int64_t y)
- native boolean **is_disjoint_from** (BD_Shape_int64_t y)
- native boolean **equals** (BD_Shape_int64_t p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (BD_Shape_int64_t p)
- native void **upper_bound_assign** (BD_Shape_int64_t p)
- native void **difference_assign** (BD_Shape_int64_t p)
- native void **concatenate_assign** (BD_Shape_int64_t p)
- native void **time_elapse_assign** (BD_Shape_int64_t p)
- native boolean **upper_bound_assign_if_exact** (BD_Shape_int64_t y)
- native boolean **simplify_using_context_assign** (BD_Shape_int64_t p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)

- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (BD_Shape_int64_t y, By_Reference< Integer > tp)
- native void **H79_widening_assign** (BD_Shape_int64_t y, By_Reference< Integer > tp)
- native void **widening_assign** (BD_Shape_int64_t y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (BD_Shape_int64_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_H79_extrapolation_assign** (BD_Shape_int64_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (BD_Shape_int64_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (BD_Shape_int64_t arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (BD_Shape_int64_t arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair < BD_Shape_int64_t, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (BD_Shape_int64_t p, BD_Shape_int64_t q)

#### Protected Member Functions

- native void **finalize** ()

### 10.7.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<int64_t>

The documentation for this class was generated from the following file:

- BD_Shape_int64_t.java

## 10.8 parma_polyhedra_library.BD_Shape_int8_t Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<int8_t>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **BD_Shape_int8_t** (long num_dimensions, Degenerate_Element kind)
- **BD_Shape_int8_t** (Int8_Box y)
- **BD_Shape_int8_t** (Int16_Box y)
- **BD_Shape_int8_t** (Int32_Box y)
- **BD_Shape_int8_t** (Int64_Box y)
- **BD_Shape_int8_t** (Uint8_Box y)
- **BD_Shape_int8_t** (Uint16_Box y)
- **BD_Shape_int8_t** (Uint32_Box y)
- **BD_Shape_int8_t** (Uint64_Box y)
- **BD_Shape_int8_t** (Z_Box y)
- **BD_Shape_int8_t** (Rational_Box y)
- **BD_Shape_int8_t** (BD_Shape_int8_t y)
- **BD_Shape_int8_t** (BD_Shape_int16_t y)
- **BD_Shape_int8_t** (BD_Shape_int32_t y)
- **BD_Shape_int8_t** (BD_Shape_int64_t y)
- **BD_Shape_int8_t** (BD_Shape_mpz_class y)
- **BD_Shape_int8_t** (BD_Shape_mpq_class y)
- **BD_Shape_int8_t** (Octagonal_Shape_int8_t y)
- **BD_Shape_int8_t** (Octagonal_Shape_int16_t y)
- **BD_Shape_int8_t** (Octagonal_Shape_int32_t y)
- **BD_Shape_int8_t** (Octagonal_Shape_int64_t y)
- **BD_Shape_int8_t** (Octagonal_Shape_mpz_class y)
- **BD_Shape_int8_t** (Octagonal_Shape_mpq_class y)
- **BD_Shape_int8_t** (C_Polyhedron y)
- **BD_Shape_int8_t** (NNC_Polyhedron y)
- **BD_Shape_int8_t** (Grid y)
- **BD_Shape_int8_t** (Float_Box y)
- **BD_Shape_int8_t** (BD_Shape_float y)
- **BD_Shape_int8_t** (Octagonal_Shape_float y)
- **BD_Shape_int8_t** (Double_Box y)
- **BD_Shape_int8_t** (BD_Shape_double y)
- **BD_Shape_int8_t** (Octagonal_Shape_double y)
- **BD_Shape_int8_t** (Long_Double_Box y)
- **BD_Shape_int8_t** (BD_Shape_long_double y)
- **BD_Shape_int8_t** (Octagonal_Shape_long_double y)
- **BD_Shape_int8_t** (Int8_Box y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Int16_Box y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Int32_Box y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Int64_Box y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Uint8_Box y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Uint16_Box y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Uint32_Box y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Uint64_Box y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Z_Box y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Rational_Box y, Complexity_Class complexity)
- **BD_Shape_int8_t** (BD_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_int8_t** (BD_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_int8_t** (BD_Shape_int32_t y, Complexity_Class complexity)

- **BD_Shape_int8_t** (BD_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_int8_t** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_int8_t** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_int8_t** (C_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_int8_t** (NNC_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Grid y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Float_Box y, Complexity_Class complexity)
- **BD_Shape_int8_t** (BD_Shape_float y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Octagonal_Shape_float y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Double_Box y, Complexity_Class complexity)
- **BD_Shape_int8_t** (BD_Shape_double y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Octagonal_Shape_double y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Long_Double_Box y, Complexity_Class complexity)
- **BD_Shape_int8_t** (BD_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_int8_t** (Constraint_System cs)
- **BD_Shape_int8_t** (Congruence_System cs)
- **BD_Shape_int8_t** (Generator_System cs)
- native void **swap** (BD_Shape_int8_t y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)

- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (BD_Shape_int8_t y)
- native boolean **strictly_contains** (BD_Shape_int8_t y)
- native boolean **is_disjoint_from** (BD_Shape_int8_t y)
- native boolean **equals** (BD_Shape_int8_t p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (BD_Shape_int8_t p)
- native void **upper_bound_assign** (BD_Shape_int8_t p)
- native void **difference_assign** (BD_Shape_int8_t p)
- native void **concatenate_assign** (BD_Shape_int8_t p)
- native void **time_elapse_assign** (BD_Shape_int8_t p)
- native boolean **upper_bound_assign_if_exact** (BD_Shape_int8_t y)
- native boolean **simplify_using_context_assign** (BD_Shape_int8_t p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)

- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (BD_Shape_int8_t y, By_Reference< Integer > tp)
- native void **H79_widening_assign** (BD_Shape_int8_t y, By_Reference< Integer > tp)
- native void **widening_assign** (BD_Shape_int8_t y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (BD_Shape_int8_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_H79_extrapolation_assign** (BD_Shape_int8_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (BD_Shape_int8_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (BD_Shape_int8_t arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (BD_Shape_int8_t arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair < BD_Shape_int8_t, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (BD_Shape_int8_t p, BD_Shape_int8_t q)

#### Protected Member Functions

- native void **finalize** ()

### 10.8.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<int8_t>

The documentation for this class was generated from the following file:

- BD_Shape_int8_t.java

## 10.9 parma_polyhedra_library.BD_Shape_long_double Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<long double>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **BD_Shape_long_double** (long num_dimensions, Degenerate_Element kind)
- **BD_Shape_long_double** (Int8_Box y)
- **BD_Shape_long_double** (Int16_Box y)
- **BD_Shape_long_double** (Int32_Box y)
- **BD_Shape_long_double** (Int64_Box y)
- **BD_Shape_long_double** (Uint8_Box y)
- **BD_Shape_long_double** (Uint16_Box y)
- **BD_Shape_long_double** (Uint32_Box y)
- **BD_Shape_long_double** (Uint64_Box y)
- **BD_Shape_long_double** (Z_Box y)
- **BD_Shape_long_double** (Rational_Box y)
- **BD_Shape_long_double** (BD_Shape_int8_t y)
- **BD_Shape_long_double** (BD_Shape_int16_t y)
- **BD_Shape_long_double** (BD_Shape_int32_t y)
- **BD_Shape_long_double** (BD_Shape_int64_t y)
- **BD_Shape_long_double** (BD_Shape_mpz_class y)
- **BD_Shape_long_double** (BD_Shape_mpq_class y)
- **BD_Shape_long_double** (Octagonal_Shape_int8_t y)
- **BD_Shape_long_double** (Octagonal_Shape_int16_t y)
- **BD_Shape_long_double** (Octagonal_Shape_int32_t y)
- **BD_Shape_long_double** (Octagonal_Shape_int64_t y)
- **BD_Shape_long_double** (Octagonal_Shape_mpz_class y)
- **BD_Shape_long_double** (Octagonal_Shape_mpq_class y)
- **BD_Shape_long_double** (C_Polyhedron y)
- **BD_Shape_long_double** (NNC_Polyhedron y)
- **BD_Shape_long_double** (Grid y)
- **BD_Shape_long_double** (Float_Box y)
- **BD_Shape_long_double** (BD_Shape_float y)
- **BD_Shape_long_double** (Octagonal_Shape_float y)
- **BD_Shape_long_double** (Double_Box y)
- **BD_Shape_long_double** (BD_Shape_double y)
- **BD_Shape_long_double** (Octagonal_Shape_double y)
- **BD_Shape_long_double** (Long_Double_Box y)
- **BD_Shape_long_double** (BD_Shape_long_double y)
- **BD_Shape_long_double** (Octagonal_Shape_long_double y)
- **BD_Shape_long_double** (Int8_Box y, Complexity_Class complexity)
- **BD_Shape_long_double** (Int16_Box y, Complexity_Class complexity)
- **BD_Shape_long_double** (Int32_Box y, Complexity_Class complexity)
- **BD_Shape_long_double** (Int64_Box y, Complexity_Class complexity)
- **BD_Shape_long_double** (Uint8_Box y, Complexity_Class complexity)
- **BD_Shape_long_double** (Uint16_Box y, Complexity_Class complexity)
- **BD_Shape_long_double** (Uint32_Box y, Complexity_Class complexity)
- **BD_Shape_long_double** (Uint64_Box y, Complexity_Class complexity)
- **BD_Shape_long_double** (Z_Box y, Complexity_Class complexity)
- **BD_Shape_long_double** (Rational_Box y, Complexity_Class complexity)
- **BD_Shape_long_double** (BD_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_long_double** (BD_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_long_double** (BD_Shape_int32_t y, Complexity_Class complexity)

- **BD_Shape_long_double** (BD_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_long_double** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_long_double** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_long_double** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_long_double** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_long_double** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **BD_Shape_long_double** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_long_double** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_long_double** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_long_double** (C_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_long_double** (NNC_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_long_double** (Grid y, Complexity_Class complexity)
- **BD_Shape_long_double** (Float_Box y, Complexity_Class complexity)
- **BD_Shape_long_double** (BD_Shape_float y, Complexity_Class complexity)
- **BD_Shape_long_double** (Octagonal_Shape_float y, Complexity_Class complexity)
- **BD_Shape_long_double** (Double_Box y, Complexity_Class complexity)
- **BD_Shape_long_double** (BD_Shape_double y, Complexity_Class complexity)
- **BD_Shape_long_double** (Octagonal_Shape_double y, Complexity_Class complexity)
- **BD_Shape_long_double** (Long_Double_Box y, Complexity_Class complexity)
- **BD_Shape_long_double** (BD_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_long_double** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_long_double** (Constraint_System cs)
- **BD_Shape_long_double** (Congruence_System cs)
- **BD_Shape_long_double** (Generator_System cs)
- native void **swap** (BD_Shape_long_double y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)

- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (BD_Shape_long_double y)
- native boolean **strictly_contains** (BD_Shape_long_double y)
- native boolean **is_disjoint_from** (BD_Shape_long_double y)
- native boolean **equals** (BD_Shape_long_double p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (BD_Shape_long_double p)
- native void **upper_bound_assign** (BD_Shape_long_double p)
- native void **difference_assign** (BD_Shape_long_double p)
- native void **concatenate_assign** (BD_Shape_long_double p)
- native void **time_elapse_assign** (BD_Shape_long_double p)
- native boolean **upper_bound_assign_if_exact** (BD_Shape_long_double y)
- native boolean **simplify_using_context_assign** (BD_Shape_long_double p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)

- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (BD_Shape_long_double y, By_Reference< Integer > tp)
- native void **H79_widening_assign** (BD_Shape_long_double y, By_Reference< Integer > tp)
- native void **widening_assign** (BD_Shape_long_double y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (BD_Shape_long_double y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_H79_extrapolation_assign** (BD_Shape_long_double y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (BD_Shape_long_double y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (BD_Shape_long_double arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (BD_Shape_long_double arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair < BD_Shape_long_double, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (BD_Shape_long_double p, BD_Shape_long_double q)

#### Protected Member Functions

- native void **finalize** ()

### 10.9.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<long double>

The documentation for this class was generated from the following file:

- BD_Shape_long_double.java

## 10.10 parma_polyhedra_library.BD_Shape_mpq_class Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<mpq_class>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **BD_Shape_mpq_class** (long num_dimensions, Degenerate_Element kind)
- **BD_Shape_mpq_class** (Int8_Box y)
- **BD_Shape_mpq_class** (Int16_Box y)
- **BD_Shape_mpq_class** (Int32_Box y)
- **BD_Shape_mpq_class** (Int64_Box y)
- **BD_Shape_mpq_class** (Uint8_Box y)
- **BD_Shape_mpq_class** (Uint16_Box y)
- **BD_Shape_mpq_class** (Uint32_Box y)
- **BD_Shape_mpq_class** (Uint64_Box y)
- **BD_Shape_mpq_class** (Z_Box y)
- **BD_Shape_mpq_class** (Rational_Box y)
- **BD_Shape_mpq_class** (BD_Shape_int8_t y)
- **BD_Shape_mpq_class** (BD_Shape_int16_t y)
- **BD_Shape_mpq_class** (BD_Shape_int32_t y)
- **BD_Shape_mpq_class** (BD_Shape_int64_t y)
- **BD_Shape_mpq_class** (BD_Shape_mpz_class y)
- **BD_Shape_mpq_class** (BD_Shape_mpq_class y)
- **BD_Shape_mpq_class** (Octagonal_Shape_int8_t y)
- **BD_Shape_mpq_class** (Octagonal_Shape_int16_t y)
- **BD_Shape_mpq_class** (Octagonal_Shape_int32_t y)
- **BD_Shape_mpq_class** (Octagonal_Shape_int64_t y)
- **BD_Shape_mpq_class** (Octagonal_Shape_mpz_class y)
- **BD_Shape_mpq_class** (Octagonal_Shape_mpq_class y)
- **BD_Shape_mpq_class** (C_Polyhedron y)
- **BD_Shape_mpq_class** (NNC_Polyhedron y)
- **BD_Shape_mpq_class** (Grid y)
- **BD_Shape_mpq_class** (Float_Box y)
- **BD_Shape_mpq_class** (BD_Shape_float y)
- **BD_Shape_mpq_class** (Octagonal_Shape_float y)
- **BD_Shape_mpq_class** (Double_Box y)
- **BD_Shape_mpq_class** (BD_Shape_double y)
- **BD_Shape_mpq_class** (Octagonal_Shape_double y)
- **BD_Shape_mpq_class** (Long_Double_Box y)
- **BD_Shape_mpq_class** (BD_Shape_long_double y)
- **BD_Shape_mpq_class** (Octagonal_Shape_long_double y)
- **BD_Shape_mpq_class** (Int8_Box y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Int16_Box y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Int32_Box y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Int64_Box y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Uint8_Box y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Uint16_Box y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Uint32_Box y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Uint64_Box y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Z_Box y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Rational_Box y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (BD_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (BD_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (BD_Shape_int32_t y, Complexity_Class complexity)

- **BD_Shape_mpq_class** (BD_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (C_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (NNC_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Grid y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Float_Box y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (BD_Shape_float y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Octagonal_Shape_float y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Double_Box y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (BD_Shape_double y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Octagonal_Shape_double y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Long_Double_Box y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (BD_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_mpq_class** (Constraint_System cs)
- **BD_Shape_mpq_class** (Congruence_System cs)
- **BD_Shape_mpq_class** (Generator_System cs)
- native void **swap** (BD_Shape_mpq_class y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)

- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (BD_Shape_mpq_class y)
- native boolean **strictly_contains** (BD_Shape_mpq_class y)
- native boolean **is_disjoint_from** (BD_Shape_mpq_class y)
- native boolean **equals** (BD_Shape_mpq_class p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (BD_Shape_mpq_class p)
- native void **upper_bound_assign** (BD_Shape_mpq_class p)
- native void **difference_assign** (BD_Shape_mpq_class p)
- native void **concatenate_assign** (BD_Shape_mpq_class p)
- native void **time_elapse_assign** (BD_Shape_mpq_class p)
- native boolean **upper_bound_assign_if_exact** (BD_Shape_mpq_class y)
- native boolean **simplify_using_context_assign** (BD_Shape_mpq_class p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)

- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (BD_Shape_mpq_class y, By_Reference< Integer > tp)
- native void **H79_widening_assign** (BD_Shape_mpq_class y, By_Reference< Integer > tp)
- native void **widening_assign** (BD_Shape_mpq_class y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (BD_Shape_mpq_class y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_H79_extrapolation_assign** (BD_Shape_mpq_class y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (BD_Shape_mpq_class y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (BD_Shape_mpq_class arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (BD_Shape_mpq_class arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair < BD_Shape_mpq_class, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (BD_Shape_mpq_class p, BD_Shape_mpq_class q)

#### Protected Member Functions

- native void **finalize** ()

### 10.10.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<mpq_class>

The documentation for this class was generated from the following file:

- BD_Shape_mpq_class.java

## 10.11 parma_polyhedra_library.BD_Shape_mpz_class Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<mpz_class>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **BD_Shape_mpz_class** (long num_dimensions, Degenerate_Element kind)
- **BD_Shape_mpz_class** (Int8_Box y)
- **BD_Shape_mpz_class** (Int16_Box y)
- **BD_Shape_mpz_class** (Int32_Box y)
- **BD_Shape_mpz_class** (Int64_Box y)
- **BD_Shape_mpz_class** (Uint8_Box y)
- **BD_Shape_mpz_class** (Uint16_Box y)
- **BD_Shape_mpz_class** (Uint32_Box y)
- **BD_Shape_mpz_class** (Uint64_Box y)
- **BD_Shape_mpz_class** (Z_Box y)
- **BD_Shape_mpz_class** (Rational_Box y)
- **BD_Shape_mpz_class** (BD_Shape_int8_t y)
- **BD_Shape_mpz_class** (BD_Shape_int16_t y)
- **BD_Shape_mpz_class** (BD_Shape_int32_t y)
- **BD_Shape_mpz_class** (BD_Shape_int64_t y)
- **BD_Shape_mpz_class** (BD_Shape_mpz_class y)
- **BD_Shape_mpz_class** (BD_Shape_mpq_class y)
- **BD_Shape_mpz_class** (Octagonal_Shape_int8_t y)
- **BD_Shape_mpz_class** (Octagonal_Shape_int16_t y)
- **BD_Shape_mpz_class** (Octagonal_Shape_int32_t y)
- **BD_Shape_mpz_class** (Octagonal_Shape_int64_t y)
- **BD_Shape_mpz_class** (Octagonal_Shape_mpz_class y)
- **BD_Shape_mpz_class** (Octagonal_Shape_mpq_class y)
- **BD_Shape_mpz_class** (C_Polyhedron y)
- **BD_Shape_mpz_class** (NNC_Polyhedron y)
- **BD_Shape_mpz_class** (Grid y)
- **BD_Shape_mpz_class** (Float_Box y)
- **BD_Shape_mpz_class** (BD_Shape_float y)
- **BD_Shape_mpz_class** (Octagonal_Shape_float y)
- **BD_Shape_mpz_class** (Double_Box y)
- **BD_Shape_mpz_class** (BD_Shape_double y)
- **BD_Shape_mpz_class** (Octagonal_Shape_double y)
- **BD_Shape_mpz_class** (Long_Double_Box y)
- **BD_Shape_mpz_class** (BD_Shape_long_double y)
- **BD_Shape_mpz_class** (Octagonal_Shape_long_double y)
- **BD_Shape_mpz_class** (Int8_Box y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Int16_Box y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Int32_Box y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Int64_Box y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Uint8_Box y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Uint16_Box y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Uint32_Box y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Uint64_Box y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Z_Box y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Rational_Box y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (BD_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (BD_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (BD_Shape_int32_t y, Complexity_Class complexity)

- **BD_Shape_mpz_class** (BD_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (C_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (NNC_Polyhedron y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Grid y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Float_Box y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (BD_Shape_float y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Octagonal_Shape_float y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Double_Box y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (BD_Shape_double y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Octagonal_Shape_double y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Long_Double_Box y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (BD_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **BD_Shape_mpz_class** (Constraint_System cs)
- **BD_Shape_mpz_class** (Congruence_System cs)
- **BD_Shape_mpz_class** (Generator_System cs)
- native void **swap** (BD_Shape_mpz_class y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)

- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (BD_Shape_mpz_class y)
- native boolean **strictly_contains** (BD_Shape_mpz_class y)
- native boolean **is_disjoint_from** (BD_Shape_mpz_class y)
- native boolean **equals** (BD_Shape_mpz_class p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (BD_Shape_mpz_class p)
- native void **upper_bound_assign** (BD_Shape_mpz_class p)
- native void **difference_assign** (BD_Shape_mpz_class p)
- native void **concatenate_assign** (BD_Shape_mpz_class p)
- native void **time_elapse_assign** (BD_Shape_mpz_class p)
- native boolean **upper_bound_assign_if_exact** (BD_Shape_mpz_class y)
- native boolean **simplify_using_context_assign** (BD_Shape_mpz_class p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)

- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (BD_Shape_mpz_class y, By_Reference< Integer > tp)
- native void **H79_widening_assign** (BD_Shape_mpz_class y, By_Reference< Integer > tp)
- native void **widening_assign** (BD_Shape_mpz_class y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (BD_Shape_mpz_class y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_H79_extrapolation_assign** (BD_Shape_mpz_class y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (BD_Shape_mpz_class y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (BD_Shape_mpz_class arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (BD_Shape_mpz_class arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair < BD_Shape_mpz_class, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (BD_Shape_mpz_class p, BD_Shape_mpz_class q)

#### Protected Member Functions

- native void **finalize** ()

### 10.11.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::BD_Shape<mpz_class>

The documentation for this class was generated from the following file:

- BD_Shape_mpz_class.java

## 10.12 parma_polyhedra_library.Bounded_Integer_Type_Overflow Enum Reference

Overflow behavior of bounded integer types.

#### Static Public Member Functions

- **[static initializer]**

#### Public Attributes

- OVERFLOW_WRAPS

  *On overflow, wrapping takes place.*
- OVERFLOW_UNDEFINED

  *On overflow, the result is undefined.*

### 10.12.1 Detailed Description

Overflow behavior of bounded integer types.

The documentation for this enum was generated from the following file:

- Bounded_Integer_Type_Overflow.java

## 10.13 parma_polyhedra_library.Bounded_Integer_Type_Representation Enum Reference

Representation of bounded integer types.

#### Static Public Member Functions

- **[static initializer]**

#### Public Attributes

- UNSIGNED

  *Unsigned binary.*

### 10.13.1 Detailed Description

Representation of bounded integer types.

The documentation for this enum was generated from the following file:

- Bounded_Integer_Type_Representation.java

## 10.14 parma_polyhedra_library.Bounded_Integer_Type_Width Enum Reference

Widths of bounded integer types.

#### Static Public Member Functions

- **[static initializer]**

### Public Attributes

- BITS_8

  *Minimization is requested.*
- BITS_16

  *16 bits.*
- BITS_32

  *32 bits.*
- BITS_64

  *64 bits.*

#### 10.14.1 Detailed Description

Widths of bounded integer types.

The documentation for this enum was generated from the following file:

- Bounded_Integer_Type_Width.java

## 10.15 parma_polyhedra_library.By_Reference< T > Class Reference

An utility class implementing mutable and non-mutable call-by-reference.

### Public Member Functions

- By_Reference (T object_value)

  *Builds an object encapsulating* `object_value`.
- void set (T y)

  *Set an object to value* `object_value`.
- T get ()

  *Returns the value held by* `this`.

#### 10.15.1 Detailed Description

An utility class implementing mutable and non-mutable call-by-reference.

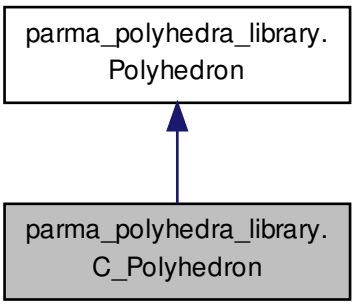
The documentation for this class was generated from the following file:

- By_Reference.java

## 10.16 parma_polyhedra_library.C_Polyhedron Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::C_Polyhedron.

Inheritance diagram for parma_polyhedra_library.C_Polyhedron:




### Public Member Functions

- **C_Polyhedron** (long num_dimensions, Degenerate_Element kind)
- **C_Polyhedron** (Int8_Box y)
- **C_Polyhedron** (Int16_Box y)
- **C_Polyhedron** (Int32_Box y)
- **C_Polyhedron** (Int64_Box y)
- **C_Polyhedron** (Uint8_Box y)
- **C_Polyhedron** (Uint16_Box y)
- **C_Polyhedron** (Uint32_Box y)
- **C_Polyhedron** (Uint64_Box y)
- **C_Polyhedron** (Z_Box y)
- **C_Polyhedron** (Rational_Box y)
- **C_Polyhedron** (BD_Shape_int8_t y)
- **C_Polyhedron** (BD_Shape_int16_t y)
- **C_Polyhedron** (BD_Shape_int32_t y)
- **C_Polyhedron** (BD_Shape_int64_t y)
- **C_Polyhedron** (BD_Shape_mpz_class y)
- **C_Polyhedron** (BD_Shape_mpq_class y)
- **C_Polyhedron** (Octagonal_Shape_int8_t y)
- **C_Polyhedron** (Octagonal_Shape_int16_t y)
- **C_Polyhedron** (Octagonal_Shape_int32_t y)
- **C_Polyhedron** (Octagonal_Shape_int64_t y)
- **C_Polyhedron** (Octagonal_Shape_mpz_class y)
- **C_Polyhedron** (Octagonal_Shape_mpq_class y)
- **C_Polyhedron** (C_Polyhedron y)
- **C_Polyhedron** (NNC_Polyhedron y)
- **C_Polyhedron** (Grid y)
- **C_Polyhedron** (Float_Box y)
- **C_Polyhedron** (BD_Shape_float y)
- **C_Polyhedron** (Octagonal_Shape_float y)

- **C_Polyhedron** (Double_Box y)
- **C_Polyhedron** (BD_Shape_double y)
- **C_Polyhedron** (Octagonal_Shape_double y)
- **C_Polyhedron** (Long_Double_Box y)
- **C_Polyhedron** (BD_Shape_long_double y)
- **C_Polyhedron** (Octagonal_Shape_long_double y)
- **C_Polyhedron** (Int8_Box y, Complexity_Class complexity)
- **C_Polyhedron** (Int16_Box y, Complexity_Class complexity)
- **C_Polyhedron** (Int32_Box y, Complexity_Class complexity)
- **C_Polyhedron** (Int64_Box y, Complexity_Class complexity)
- **C_Polyhedron** (Uint8_Box y, Complexity_Class complexity)
- **C_Polyhedron** (Uint16_Box y, Complexity_Class complexity)
- **C_Polyhedron** (Uint32_Box y, Complexity_Class complexity)
- **C_Polyhedron** (Uint64_Box y, Complexity_Class complexity)
- **C_Polyhedron** (Z_Box y, Complexity_Class complexity)
- **C_Polyhedron** (Rational_Box y, Complexity_Class complexity)
- **C_Polyhedron** (BD_Shape_int8_t y, Complexity_Class complexity)
- **C_Polyhedron** (BD_Shape_int16_t y, Complexity_Class complexity)
- **C_Polyhedron** (BD_Shape_int32_t y, Complexity_Class complexity)
- **C_Polyhedron** (BD_Shape_int64_t y, Complexity_Class complexity)
- **C_Polyhedron** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **C_Polyhedron** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **C_Polyhedron** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **C_Polyhedron** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **C_Polyhedron** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **C_Polyhedron** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **C_Polyhedron** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **C_Polyhedron** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **C_Polyhedron** (C_Polyhedron y, Complexity_Class complexity)
- **C_Polyhedron** (NNC_Polyhedron y, Complexity_Class complexity)
- **C_Polyhedron** (Grid y, Complexity_Class complexity)
- **C_Polyhedron** (Float_Box y, Complexity_Class complexity)
- **C_Polyhedron** (BD_Shape_float y, Complexity_Class complexity)
- **C_Polyhedron** (Octagonal_Shape_float y, Complexity_Class complexity)
- **C_Polyhedron** (Double_Box y, Complexity_Class complexity)
- **C_Polyhedron** (BD_Shape_double y, Complexity_Class complexity)
- **C_Polyhedron** (Octagonal_Shape_double y, Complexity_Class complexity)
- **C_Polyhedron** (Long_Double_Box y, Complexity_Class complexity)
- **C_Polyhedron** (BD_Shape_long_double y, Complexity_Class complexity)
- **C_Polyhedron** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **C_Polyhedron** (Constraint_System cs)
- **C_Polyhedron** (Congruence_System cs)
- **C_Polyhedron** (Generator_System cs)
- native boolean **upper_bound_assign_if_exact** (C_Polyhedron y)
- native boolean **poly_hull_assign_if_exact** (C_Polyhedron y)
- native void **free** ()

#### Static Public Member Functions

- static native Pair
  < C_Polyhedron,
  Pointset_Powerset_NNC_Polyhedron > **linear_partition** (C_Polyhedron p, C_Polyhedron q)

#### Protected Member Functions

- native void **finalize** ()

### 10.16.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::C_Polyhedron.

The documentation for this class was generated from the following file:

- C_Polyhedron.java

## 10.17 parma_polyhedra_library.Coefficient Class Reference

A PPL coefficient.

#### Public Member Functions

- Coefficient (int i)
  *Builds a coefficient valued* `i`.
- Coefficient (long l)
  *Builds a coefficient valued* `l`.
- Coefficient (BigInteger bi)
  *Builds a coefficient valued* `bi`.
- Coefficient (String s)
  *Builds a coefficient from the decimal representation in* `s`.
- Coefficient (Coefficient c)
  *Builds a copy of* `c`.
- String toString ()
  *Returns a String representation of* `this`.
- BigInteger getBigInteger ()
  *Returns the value held by* `this`.

#### Static Public Member Functions

- static native int bits ()
  *Returns the number of bits of PPL coefficients; 0 if unbounded.*

### 10.17.1 Detailed Description

A PPL coefficient.

Objects of type Coefficient are used to implement the integral valued coefficients occurring in linear expressions, constraints, generators and so on.

### 10.17.2 Constructor & Destructor Documentation

#### 10.17.2.1 parma_polyhedra_library.Coefficient.Coefficient ( String *s* ) [inline]

Builds a coefficient from the decimal representation in `s`.

**Exceptions**

| | |
|---|---|
| *java.lang.NumberFormat-Exception* | Thrown if `s` does not contain a valid decimal representation. |

The documentation for this class was generated from the following file:

- Coefficient.java

## 10.18 parma_polyhedra_library.Complexity_Class Enum Reference

Possible Complexities.

**Static Public Member Functions**

- **[static initializer]**

**Public Attributes**

- POLYNOMIAL_COMPLEXITY
  *Worst-case polynomial complexity.*
- SIMPLEX_COMPLEXITY
  *Worst-case exponential complexity but typically polynomial behavior.*

### 10.18.1 Detailed Description

Possible Complexities.

The documentation for this enum was generated from the following file:

- Complexity_Class.java

## 10.19 parma_polyhedra_library.Congruence Class Reference

A linear congruence.

**Public Member Functions**

- Congruence (Linear_Expression e1, Linear_Expression e2, Coefficient m)
  *Returns the congruence* `e1` $=$ `e2` $\pmod{\texttt{m}}$.
- Linear_Expression left_hand_side ()
  *Returns the left hand side of* `this`.
- Linear_Expression right_hand_side ()

*Returns the right hand side of* `this`.

- Coefficient modulus ()

  *Returns the relation symbol of* `this`.
- native String ascii_dump ()

  *Returns an ascii formatted internal representation of* `this`.
- native String toString ()

  *Returns a string representation of* `this`.

#### Protected Attributes

- Coefficient mod

  *The modulus of the congruence.*

### 10.19.1 Detailed Description

A linear congruence.

An object of the class Congruence is an object represeting a congruence:

- $\mathrm{cg} = \sum_{i=0}^{n-1} a_i x_i + b = 0 \pmod{m}$

where $n$ is the dimension of the space, $a_i$ is the integer coefficient of variable $x_i$, $b$ is the integer inhomogeneous term and $m$ is the integer modulus; if $m = 0$, then cg represents the equality congruence $\sum_{i=0}^{n-1} a_i x_i + b = 0$ and, if $m \neq 0$, then the congruence cg is said to be a proper congruence.

The documentation for this class was generated from the following file:

- Congruence.java

## 10.20 parma_polyhedra_library.Congruence_System Class Reference

A system of congruences.

#### Public Member Functions

- Congruence_System ()

  *Default constructor: builds an empty system of congruences.*
- native String ascii_dump ()

  *Returns an ascii formatted internal representation of* `this`.
- native String toString ()

  *Returns a string representation of* `this`.

### 10.20.1 Detailed Description

A system of congruences.

An object of the class Congruence_System is a system of congruences, i.e., a multiset of objects of the class Congruence.

The documentation for this class was generated from the following file:

- Congruence_System.java

## 10.21 parma_polyhedra_library.Constraint Class Reference

A linear equality or inequality.

### Public Member Functions

- Constraint (Linear_Expression le1, Relation_Symbol rel_sym, Linear_Expression le2)

  *Builds a constraint from two linear expressions with a specified relation symbol.*
- Linear_Expression left_hand_side ()

  *Returns the left hand side of* `this`.
- Linear_Expression right_hand_side ()

  *Returns the right hand side of* `this`.
- Relation_Symbol kind ()

  *Returns the relation symbol of* `this`.
- native String ascii_dump ()

  *Returns an ascii formatted internal representation of* `this`.
- native String toString ()

  *Returns a string representation of* `this`.

### 10.21.1 Detailed Description

A linear equality or inequality.

An object of the class Constraint is either:

- a linear equality;
- a non-strict linear inequality;
- a strict linear inequality.

The documentation for this class was generated from the following file:

- Constraint.java

## 10.22 parma_polyhedra_library.Constraint_System Class Reference

A system of constraints.

### Public Member Functions

- Constraint_System ()

  *Default constructor: builds an empty system of constraints.*
- native String ascii_dump ()

  *Returns an ascii formatted internal representation of* `this`.
- native String toString ()

  *Returns a string representation of* `this`.

### 10.22.1 Detailed Description

A system of constraints.

An object of the class Constraint_System is a system of constraints, i.e., a multiset of objects of the class Constraint.

The documentation for this class was generated from the following file:

- Constraint_System.java

## 10.23 parma_polyhedra_library.Constraints_Product_C_Polyhedron_Grid Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Constraints_Product<C_Polyhedron,Grid>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Constraints_Product_C_Polyhedron_Grid** (long num_dimensions, Degenerate_Element kind)
- **Constraints_Product_C_Polyhedron_Grid** (Int8_Box y)
- **Constraints_Product_C_Polyhedron_Grid** (Int16_Box y)
- **Constraints_Product_C_Polyhedron_Grid** (Int32_Box y)
- **Constraints_Product_C_Polyhedron_Grid** (Int64_Box y)
- **Constraints_Product_C_Polyhedron_Grid** (Uint8_Box y)
- **Constraints_Product_C_Polyhedron_Grid** (Uint16_Box y)
- **Constraints_Product_C_Polyhedron_Grid** (Uint32_Box y)
- **Constraints_Product_C_Polyhedron_Grid** (Uint64_Box y)
- **Constraints_Product_C_Polyhedron_Grid** (Z_Box y)
- **Constraints_Product_C_Polyhedron_Grid** (Rational_Box y)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_int8_t y)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_int16_t y)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_int32_t y)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_int64_t y)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_mpz_class y)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_mpq_class y)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_int8_t y)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_int16_t y)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_int32_t y)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_int64_t y)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_mpz_class y)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_mpq_class y)
- **Constraints_Product_C_Polyhedron_Grid** (C_Polyhedron y)
- **Constraints_Product_C_Polyhedron_Grid** (NNC_Polyhedron y)
- **Constraints_Product_C_Polyhedron_Grid** (Grid y)
- **Constraints_Product_C_Polyhedron_Grid** (Float_Box y)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_float y)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_float y)
- **Constraints_Product_C_Polyhedron_Grid** (Double_Box y)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_double y)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_double y)

- **Constraints_Product_C_Polyhedron_Grid** (Long_Double_Box y)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_long_double y)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_long_double y)
- **Constraints_Product_C_Polyhedron_Grid** (Constraints_Product_C_Polyhedron_Grid y)
- **Constraints_Product_C_Polyhedron_Grid** (Int8_Box y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Int16_Box y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Int32_Box y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Int64_Box y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Uint8_Box y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Uint16_Box y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Uint32_Box y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Uint64_Box y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Z_Box y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Rational_Box y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (C_Polyhedron y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (NNC_Polyhedron y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Grid y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Float_Box y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_float y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Double_Box y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_double y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Long_Double_Box y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (BD_Shape_long_double y, Complexity_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Octagonal_Shape_long_double y, Complexity_Class complexity)

- **Constraints_Product_C_Polyhedron_Grid** (Constraints_Product_C_Polyhedron_Grid y, Complexity-_Class complexity)
- **Constraints_Product_C_Polyhedron_Grid** (Constraint_System cs)
- **Constraints_Product_C_Polyhedron_Grid** (Congruence_System cs)
- native void **swap** (Constraints_Product_C_Polyhedron_Grid y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Constraints_Product_C_Polyhedron_Grid y)
- native boolean **strictly_contains** (Constraints_Product_C_Polyhedron_Grid y)
- native boolean **is_disjoint_from** (Constraints_Product_C_Polyhedron_Grid y)
- native boolean **equals** (Constraints_Product_C_Polyhedron_Grid p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Constraints_Product_C_Polyhedron_Grid p)
- native void **upper_bound_assign** (Constraints_Product_C_Polyhedron_Grid p)
- native void **difference_assign** (Constraints_Product_C_Polyhedron_Grid p)
- native void **concatenate_assign** (Constraints_Product_C_Polyhedron_Grid p)
- native void **time_elapse_assign** (Constraints_Product_C_Polyhedron_Grid p)
- native boolean **upper_bound_assign_if_exact** (Constraints_Product_C_Polyhedron_Grid y)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)

- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **widening_assign** (Constraints_Product_C_Polyhedron_Grid y, By_Reference< Integer > tp)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.23.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Constraints_Product<C_Polyhedron,Grid>

The documentation for this class was generated from the following file:

- Constraints_Product_C_Polyhedron_Grid.java

## 10.24 parma_polyhedra_library.Constraints_Product_Grid_C_Polyhedron Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Constraints_Product<Grid,C_Polyhedron>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Constraints_Product_Grid_C_Polyhedron** (long num_dimensions, Degenerate_Element kind)
- **Constraints_Product_Grid_C_Polyhedron** (Int8_Box y)
- **Constraints_Product_Grid_C_Polyhedron** (Int16_Box y)
- **Constraints_Product_Grid_C_Polyhedron** (Int32_Box y)
- **Constraints_Product_Grid_C_Polyhedron** (Int64_Box y)
- **Constraints_Product_Grid_C_Polyhedron** (Uint8_Box y)
- **Constraints_Product_Grid_C_Polyhedron** (Uint16_Box y)
- **Constraints_Product_Grid_C_Polyhedron** (Uint32_Box y)
- **Constraints_Product_Grid_C_Polyhedron** (Uint64_Box y)
- **Constraints_Product_Grid_C_Polyhedron** (Z_Box y)
- **Constraints_Product_Grid_C_Polyhedron** (Rational_Box y)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_int8_t y)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_int16_t y)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_int32_t y)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_int64_t y)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_mpz_class y)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_mpq_class y)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_int8_t y)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_int16_t y)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_int32_t y)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_int64_t y)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_mpz_class y)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_mpq_class y)
- **Constraints_Product_Grid_C_Polyhedron** (C_Polyhedron y)
- **Constraints_Product_Grid_C_Polyhedron** (NNC_Polyhedron y)
- **Constraints_Product_Grid_C_Polyhedron** (Grid y)
- **Constraints_Product_Grid_C_Polyhedron** (Float_Box y)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_float y)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_float y)
- **Constraints_Product_Grid_C_Polyhedron** (Double_Box y)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_double y)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_double y)
- **Constraints_Product_Grid_C_Polyhedron** (Long_Double_Box y)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_long_double y)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_long_double y)
- **Constraints_Product_Grid_C_Polyhedron** (Constraints_Product_Grid_C_Polyhedron y)
- **Constraints_Product_Grid_C_Polyhedron** (Int8_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Int16_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Int32_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Int64_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Uint8_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Uint16_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Uint32_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Uint64_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Z_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Rational_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_int16_t y, Complexity_Class complexity)

- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (C_Polyhedron y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (NNC_Polyhedron y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Grid y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Float_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_float y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Double_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_double y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Long_Double_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (BD_Shape_long_double y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Constraints_Product_Grid_C_Polyhedron y, Complexity_Class complexity)
- **Constraints_Product_Grid_C_Polyhedron** (Constraint_System cs)
- **Constraints_Product_Grid_C_Polyhedron** (Congruence_System cs)
- native void **swap** (Constraints_Product_Grid_C_Polyhedron y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)

- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Constraints_Product_Grid_C_Polyhedron y)
- native boolean **strictly_contains** (Constraints_Product_Grid_C_Polyhedron y)
- native boolean **is_disjoint_from** (Constraints_Product_Grid_C_Polyhedron y)
- native boolean **equals** (Constraints_Product_Grid_C_Polyhedron p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Constraints_Product_Grid_C_Polyhedron p)
- native void **upper_bound_assign** (Constraints_Product_Grid_C_Polyhedron p)
- native void **difference_assign** (Constraints_Product_Grid_C_Polyhedron p)
- native void **concatenate_assign** (Constraints_Product_Grid_C_Polyhedron p)
- native void **time_elapse_assign** (Constraints_Product_Grid_C_Polyhedron p)
- native boolean **upper_bound_assign_if_exact** (Constraints_Product_Grid_C_Polyhedron y)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)

- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **widening_assign** (Constraints_Product_Grid_C_Polyhedron y, By_Reference< Integer > tp)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.24.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Constraints_Product<Grid,C_Polyhedron>

The documentation for this class was generated from the following file:

- Constraints_Product_Grid_C_Polyhedron.java

## 10.25 parma_polyhedra_library.Constraints_Product_Grid_NNC_Polyhedron Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Constraints_Product<Grid,NNC_Polyhedron>

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Constraints_Product_Grid_NNC_Polyhedron** (long num_dimensions, Degenerate_Element kind)
- **Constraints_Product_Grid_NNC_Polyhedron** (Int8_Box y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Int16_Box y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Int32_Box y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Int64_Box y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Uint8_Box y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Uint16_Box y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Uint32_Box y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Uint64_Box y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Z_Box y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Rational_Box y)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_int8_t y)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_int16_t y)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_int32_t y)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_int64_t y)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_mpz_class y)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_mpq_class y)

- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_int8_t y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_int16_t y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_int32_t y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_int64_t y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_mpz_class y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_mpq_class y)
- **Constraints_Product_Grid_NNC_Polyhedron** (C_Polyhedron y)
- **Constraints_Product_Grid_NNC_Polyhedron** (NNC_Polyhedron y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Grid y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Float_Box y)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_float y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_float y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Double_Box y)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_double y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_double y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Long_Double_Box y)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_long_double y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_long_double y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Constraints_Product_Grid_NNC_Polyhedron y)
- **Constraints_Product_Grid_NNC_Polyhedron** (Int8_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Int16_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Int32_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Int64_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Uint8_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Uint16_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Uint32_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Uint64_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Z_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Rational_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)

- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (C_Polyhedron y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (NNC_Polyhedron y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Grid y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Float_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_float y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Double_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_double y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Long_Double_Box y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (BD_Shape_long_double y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Constraints_Product_Grid_NNC_Polyhedron y, Complexity_Class complexity)
- **Constraints_Product_Grid_NNC_Polyhedron** (Constraint_System cs)
- **Constraints_Product_Grid_NNC_Polyhedron** (Congruence_System cs)
- native void **swap** (Constraints_Product_Grid_NNC_Polyhedron y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Constraints_Product_Grid_NNC_Polyhedron y)
- native boolean **strictly_contains** (Constraints_Product_Grid_NNC_Polyhedron y)
- native boolean **is_disjoint_from** (Constraints_Product_Grid_NNC_Polyhedron y)

- native boolean **equals** (Constraints_Product_Grid_NNC_Polyhedron p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Constraints_Product_Grid_NNC_Polyhedron p)
- native void **upper_bound_assign** (Constraints_Product_Grid_NNC_Polyhedron p)
- native void **difference_assign** (Constraints_Product_Grid_NNC_Polyhedron p)
- native void **concatenate_assign** (Constraints_Product_Grid_NNC_Polyhedron p)
- native void **time_elapse_assign** (Constraints_Product_Grid_NNC_Polyhedron p)
- native boolean **upper_bound_assign_if_exact** (Constraints_Product_Grid_NNC_Polyhedron y)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **widening_assign** (Constraints_Product_Grid_NNC_Polyhedron y, By_Reference< Integer > tp)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Protected Member Functions

- native void **finalize** ()

### 10.25.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Constraints_Product<Grid,NNC_Polyhedron>

The documentation for this class was generated from the following file:

- Constraints_Product_Grid_NNC_Polyhedron.java

## 10.26 parma_polyhedra_library.Constraints_Product_NNC_Polyhedron_Grid Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Constraints_Product<NNC_Polyhedron,Grid>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Constraints_Product_NNC_Polyhedron_Grid** (long num_dimensions, Degenerate_Element kind)
- **Constraints_Product_NNC_Polyhedron_Grid** (Int8_Box y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Int16_Box y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Int32_Box y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Int64_Box y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Uint8_Box y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Uint16_Box y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Uint32_Box y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Uint64_Box y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Z_Box y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Rational_Box y)
- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_int8_t y)
- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_int16_t y)
- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_int32_t y)
- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_int64_t y)
- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_mpz_class y)
- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_mpq_class y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_int8_t y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_int16_t y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_int32_t y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_int64_t y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_mpz_class y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_mpq_class y)
- **Constraints_Product_NNC_Polyhedron_Grid** (C_Polyhedron y)
- **Constraints_Product_NNC_Polyhedron_Grid** (NNC_Polyhedron y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Grid y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Float_Box y)
- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_float y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_float y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Double_Box y)

- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_double y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_double y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Long_Double_Box y)
- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_long_double y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_long_double y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Constraints_Product_NNC_Polyhedron_Grid y)
- **Constraints_Product_NNC_Polyhedron_Grid** (Int8_Box y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Int16_Box y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Int32_Box y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Int64_Box y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Uint8_Box y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Uint16_Box y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Uint32_Box y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Uint64_Box y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Z_Box y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Rational_Box y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (C_Polyhedron y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (NNC_Polyhedron y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Grid y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Float_Box y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_float y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Double_Box y, Complexity_Class complexity)

- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_double y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Long_Double_Box y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (BD_Shape_long_double y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Constraints_Product_NNC_Polyhedron_Grid y, Complexity_Class complexity)
- **Constraints_Product_NNC_Polyhedron_Grid** (Constraint_System cs)
- **Constraints_Product_NNC_Polyhedron_Grid** (Congruence_System cs)
- native void **swap** (Constraints_Product_NNC_Polyhedron_Grid y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Constraints_Product_NNC_Polyhedron_Grid y)
- native boolean **strictly_contains** (Constraints_Product_NNC_Polyhedron_Grid y)
- native boolean **is_disjoint_from** (Constraints_Product_NNC_Polyhedron_Grid y)
- native boolean **equals** (Constraints_Product_NNC_Polyhedron_Grid p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Constraints_Product_NNC_Polyhedron_Grid p)

- native void **upper_bound_assign** (Constraints_Product_NNC_Polyhedron_Grid p)
- native void **difference_assign** (Constraints_Product_NNC_Polyhedron_Grid p)
- native void **concatenate_assign** (Constraints_Product_NNC_Polyhedron_Grid p)
- native void **time_elapse_assign** (Constraints_Product_NNC_Polyhedron_Grid p)
- native boolean **upper_bound_assign_if_exact** (Constraints_Product_NNC_Polyhedron_Grid y)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **widening_assign** (Constraints_Product_NNC_Polyhedron_Grid y, By_Reference< Integer > tp)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.26.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Constraints_Product<NNC_Polyhedron,Grid>

The documentation for this class was generated from the following file:

- Constraints_Product_NNC_Polyhedron_Grid.java

## 10.27 parma_polyhedra_library.Control_Parameter_Name Enum Reference

Names of MIP problems' control parameters.

### Public Attributes

- PRICING

  *The pricing rule.*

### 10.27.1 Detailed Description

Names of MIP problems' control parameters.

The documentation for this enum was generated from the following file:

- Control_Parameter_Name.java

## 10.28 parma_polyhedra_library.Control_Parameter_Value Enum Reference

Possible values for MIP problem's control parameters.

### Public Attributes

- PRICING_STEEPEST_EDGE_FLOAT

  *Steepest edge pricing method, using floating points (default).*
- PRICING_STEEPEST_EDGE_EXACT

  *Steepest edge pricing method, using Coefficient.*
- PRICING_TEXTBOOK

  *Textbook pricing method.*

### 10.28.1 Detailed Description

Possible values for MIP problem's control parameters.

The documentation for this enum was generated from the following file:

- Control_Parameter_Value.java

## 10.29 parma_polyhedra_library.Degenerate_Element Enum Reference

Kinds of degenerate abstract elements.

### Static Public Member Functions

- **[static initializer]**

#### Public Attributes

- UNIVERSE

  *The universe element, i.e., the whole vector space.*

### 10.29.1 Detailed Description

Kinds of degenerate abstract elements.

The documentation for this enum was generated from the following file:

- Degenerate_Element.java

## 10.30 parma_polyhedra_library.Domain_Error_Exception Class Reference

Exceptions caused by domain errors.

#### Public Member Functions

- Domain_Error_Exception (String s)

  *Constructor.*

### 10.30.1 Detailed Description

Exceptions caused by domain errors.

The documentation for this class was generated from the following file:

- Domain_Error_Exception.java

## 10.31 parma_polyhedra_library.Double_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Double_Box.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Double_Box** (long num_dimensions, Degenerate_Element kind)
- **Double_Box** (Int8_Box y)
- **Double_Box** (Int16_Box y)
- **Double_Box** (Int32_Box y)
- **Double_Box** (Int64_Box y)
- **Double_Box** (Uint8_Box y)
- **Double_Box** (Uint16_Box y)
- **Double_Box** (Uint32_Box y)
- **Double_Box** (Uint64_Box y)
- **Double_Box** (Z_Box y)
- **Double_Box** (Rational_Box y)

- **Double_Box** (BD_Shape_int8_t y)
- **Double_Box** (BD_Shape_int16_t y)
- **Double_Box** (BD_Shape_int32_t y)
- **Double_Box** (BD_Shape_int64_t y)
- **Double_Box** (BD_Shape_mpz_class y)
- **Double_Box** (BD_Shape_mpq_class y)
- **Double_Box** (Octagonal_Shape_int8_t y)
- **Double_Box** (Octagonal_Shape_int16_t y)
- **Double_Box** (Octagonal_Shape_int32_t y)
- **Double_Box** (Octagonal_Shape_int64_t y)
- **Double_Box** (Octagonal_Shape_mpz_class y)
- **Double_Box** (Octagonal_Shape_mpq_class y)
- **Double_Box** (C_Polyhedron y)
- **Double_Box** (NNC_Polyhedron y)
- **Double_Box** (Grid y)
- **Double_Box** (Float_Box y)
- **Double_Box** (BD_Shape_float y)
- **Double_Box** (Octagonal_Shape_float y)
- **Double_Box** (Double_Box y)
- **Double_Box** (BD_Shape_double y)
- **Double_Box** (Octagonal_Shape_double y)
- **Double_Box** (Long_Double_Box y)
- **Double_Box** (BD_Shape_long_double y)
- **Double_Box** (Octagonal_Shape_long_double y)
- **Double_Box** (Int8_Box y, Complexity_Class complexity)
- **Double_Box** (Int16_Box y, Complexity_Class complexity)
- **Double_Box** (Int32_Box y, Complexity_Class complexity)
- **Double_Box** (Int64_Box y, Complexity_Class complexity)
- **Double_Box** (Uint8_Box y, Complexity_Class complexity)
- **Double_Box** (Uint16_Box y, Complexity_Class complexity)
- **Double_Box** (Uint32_Box y, Complexity_Class complexity)
- **Double_Box** (Uint64_Box y, Complexity_Class complexity)
- **Double_Box** (Z_Box y, Complexity_Class complexity)
- **Double_Box** (Rational_Box y, Complexity_Class complexity)
- **Double_Box** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Double_Box** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Double_Box** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Double_Box** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Double_Box** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Double_Box** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Double_Box** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Double_Box** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Double_Box** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Double_Box** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Double_Box** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Double_Box** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Double_Box** (C_Polyhedron y, Complexity_Class complexity)
- **Double_Box** (NNC_Polyhedron y, Complexity_Class complexity)
- **Double_Box** (Grid y, Complexity_Class complexity)
- **Double_Box** (Float_Box y, Complexity_Class complexity)

- **Double_Box** (BD_Shape_float y, Complexity_Class complexity)
- **Double_Box** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Double_Box** (Double_Box y, Complexity_Class complexity)
- **Double_Box** (BD_Shape_double y, Complexity_Class complexity)
- **Double_Box** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Double_Box** (Long_Double_Box y, Complexity_Class complexity)
- **Double_Box** (BD_Shape_long_double y, Complexity_Class complexity)
- **Double_Box** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Double_Box** (Constraint_System cs)
- **Double_Box** (Congruence_System cs)
- **Double_Box** (Generator_System cs)
- native void **swap** (Double_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **has_upper_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)
- native boolean **has_lower_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Double_Box y)
- native boolean **strictly_contains** (Double_Box y)
- native boolean **is_disjoint_from** (Double_Box y)
- native boolean **equals** (Double_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)

- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Double_Box p)
- native void **upper_bound_assign** (Double_Box p)
- native void **difference_assign** (Double_Box p)
- native void **concatenate_assign** (Double_Box p)
- native void **time_elapse_assign** (Double_Box p)
- native boolean **upper_bound_assign_if_exact** (Double_Box y)
- native boolean **simplify_using_context_assign** (Double_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **CC76_widening_assign** (Double_Box y, By_Reference< Integer > tp)
- native void **widening_assign** (Double_Box y, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Double_Box y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Double_Box arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)

- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair< Double_Box, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Double_Box p, Double_Box q)

#### Protected Member Functions

- native void **finalize** ()

### 10.31.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Double_Box.

The documentation for this class was generated from the following file:

- Double_Box.java

## 10.32 parma_polyhedra_library.Float_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Float_Box.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Float_Box** (long num_dimensions, Degenerate_Element kind)
- **Float_Box** (Int8_Box y)
- **Float_Box** (Int16_Box y)
- **Float_Box** (Int32_Box y)
- **Float_Box** (Int64_Box y)
- **Float_Box** (Uint8_Box y)
- **Float_Box** (Uint16_Box y)
- **Float_Box** (Uint32_Box y)
- **Float_Box** (Uint64_Box y)
- **Float_Box** (Z_Box y)
- **Float_Box** (Rational_Box y)
- **Float_Box** (BD_Shape_int8_t y)
- **Float_Box** (BD_Shape_int16_t y)
- **Float_Box** (BD_Shape_int32_t y)
- **Float_Box** (BD_Shape_int64_t y)
- **Float_Box** (BD_Shape_mpz_class y)
- **Float_Box** (BD_Shape_mpq_class y)
- **Float_Box** (Octagonal_Shape_int8_t y)
- **Float_Box** (Octagonal_Shape_int16_t y)
- **Float_Box** (Octagonal_Shape_int32_t y)
- **Float_Box** (Octagonal_Shape_int64_t y)

- **Float_Box** (Octagonal_Shape_mpz_class y)
- **Float_Box** (Octagonal_Shape_mpq_class y)
- **Float_Box** (C_Polyhedron y)
- **Float_Box** (NNC_Polyhedron y)
- **Float_Box** (Grid y)
- **Float_Box** (Float_Box y)
- **Float_Box** (BD_Shape_float y)
- **Float_Box** (Octagonal_Shape_float y)
- **Float_Box** (Double_Box y)
- **Float_Box** (BD_Shape_double y)
- **Float_Box** (Octagonal_Shape_double y)
- **Float_Box** (Long_Double_Box y)
- **Float_Box** (BD_Shape_long_double y)
- **Float_Box** (Octagonal_Shape_long_double y)
- **Float_Box** (Int8_Box y, Complexity_Class complexity)
- **Float_Box** (Int16_Box y, Complexity_Class complexity)
- **Float_Box** (Int32_Box y, Complexity_Class complexity)
- **Float_Box** (Int64_Box y, Complexity_Class complexity)
- **Float_Box** (Uint8_Box y, Complexity_Class complexity)
- **Float_Box** (Uint16_Box y, Complexity_Class complexity)
- **Float_Box** (Uint32_Box y, Complexity_Class complexity)
- **Float_Box** (Uint64_Box y, Complexity_Class complexity)
- **Float_Box** (Z_Box y, Complexity_Class complexity)
- **Float_Box** (Rational_Box y, Complexity_Class complexity)
- **Float_Box** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Float_Box** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Float_Box** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Float_Box** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Float_Box** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Float_Box** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Float_Box** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Float_Box** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Float_Box** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Float_Box** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Float_Box** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Float_Box** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Float_Box** (C_Polyhedron y, Complexity_Class complexity)
- **Float_Box** (NNC_Polyhedron y, Complexity_Class complexity)
- **Float_Box** (Grid y, Complexity_Class complexity)
- **Float_Box** (Float_Box y, Complexity_Class complexity)
- **Float_Box** (BD_Shape_float y, Complexity_Class complexity)
- **Float_Box** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Float_Box** (Double_Box y, Complexity_Class complexity)
- **Float_Box** (BD_Shape_double y, Complexity_Class complexity)
- **Float_Box** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Float_Box** (Long_Double_Box y, Complexity_Class complexity)
- **Float_Box** (BD_Shape_long_double y, Complexity_Class complexity)
- **Float_Box** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Float_Box** (Constraint_System cs)
- **Float_Box** (Congruence_System cs)

- **Float_Box** (Generator_System cs)
- native void **swap** (Float_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **has_upper_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_Reference< Boolean > closed)
- native boolean **has_lower_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_Reference< Boolean > closed)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Float_Box y)
- native boolean **strictly_contains** (Float_Box y)
- native boolean **is_disjoint_from** (Float_Box y)
- native boolean **equals** (Float_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Float_Box p)
- native void **upper_bound_assign** (Float_Box p)
- native void **difference_assign** (Float_Box p)

- native void **concatenate_assign** (Float_Box p)
- native void **time_elapse_assign** (Float_Box p)
- native boolean **upper_bound_assign_if_exact** (Float_Box y)
- native boolean **simplify_using_context_assign** (Float_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **CC76_widening_assign** (Float_Box y, By_Reference< Integer > tp)
- native void **widening_assign** (Float_Box y, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Float_Box y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Float_Box arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_-Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity-_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Static Public Member Functions

- static native Pair< Float_Box, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Float_Box p, Float_Box q)

#### Protected Member Functions

- native void **finalize** ()

### 10.32.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Float_Box.

The documentation for this class was generated from the following file:

- Float_Box.java

## 10.33 parma_polyhedra_library.Generator Class Reference

A line, ray, point or closure point.

#### Public Member Functions

- Generator_Type type ()

  *Returns the generator type.*
- Linear_Expression linear_expression ()

  *Returns the linear expression in* `this`.
- Coefficient divisor ()

  *If* `this` *is either a point or a closure point, returns its divisor.*
- native String ascii_dump ()

  *Returns an ascii formatted internal representation of* `this`.
- native String toString ()

  *Returns a string representation of* `this`.

#### Static Public Member Functions

- static Generator closure_point (Linear_Expression e, Coefficient d)

  *Returns the closure point at* `e` / `d`.
- static Generator line (Linear_Expression e)

  *Returns the line of direction* `e`.
- static Generator point (Linear_Expression e, Coefficient d)

  *Returns the point at* `e` / `d`.
- static Generator ray (Linear_Expression e)

  *Returns the ray of direction* `e`.

### 10.33.1 Detailed Description

A line, ray, point or closure point.

An object of the class Generator is one of the following:

- a line;
- a ray;

- a point;
- a closure point.

### 10.33.2 Member Function Documentation

#### 10.33.2.1 static Generator parma_polyhedra_library.Generator.closure_point ( Linear_Expression *e*, Coefficient *d* ) [inline], [static]

Returns the closure point at `e` / `d`.

**Exceptions**

| | |
|---|---|
| *RuntimeErrorException* | Thrown if `d` is zero. |

#### 10.33.2.2 static Generator parma_polyhedra_library.Generator.line ( Linear_Expression *e* ) [inline], [static]

Returns the line of direction `e`.

**Exceptions**

| | |
|---|---|
| *RuntimeErrorException* | Thrown if the homogeneous part of `e` represents the origin of the vector space. |

#### 10.33.2.3 static Generator parma_polyhedra_library.Generator.point ( Linear_Expression *e*, Coefficient *d* ) [inline], [static]

Returns the point at `e` / `d`.

**Exceptions**

| | |
|---|---|
| *RuntimeErrorException* | Thrown if `d` is zero. |

#### 10.33.2.4 static Generator parma_polyhedra_library.Generator.ray ( Linear_Expression *e* ) [inline], [static]

Returns the ray of direction `e`.

**Exceptions**

| | |
|---|---|
| *RuntimeErrorException* | Thrown if the homogeneous part of `e` represents the origin of the vector space. |

#### 10.33.2.5 Coefficient parma_polyhedra_library.Generator.divisor ( ) [inline]

If `this` is either a point or a closure point, returns its divisor.

**Exceptions**

| | |
|---|---|
| *RuntimeErrorException* | Thrown if `this` is neither a point nor a closure point. |

The documentation for this class was generated from the following file:

- Generator.java

## 10.34 parma_polyhedra_library.Generator_System Class Reference

A system of generators.

### Public Member Functions

- Generator_System ()

  *Default constructor: builds an empty system of generators.*
- native String ascii_dump ()

  *Returns an ascii formatted internal representation of* `this`.
- native String toString ()

  *Returns a string representation of* `this`.

### 10.34.1 Detailed Description

A system of generators.

An object of the class Generator_System is a system of generators, i.e., a multiset of objects of the class Generator (lines, rays, points and closure points).

The documentation for this class was generated from the following file:

- Generator_System.java

## 10.35 parma_polyhedra_library.Generator_Type Enum Reference

The generator type.

### Static Public Member Functions

- **[static initializer]**

### Public Attributes

- LINE

  *The generator is a line.*
- RAY

  *The generator is a ray.*
- POINT

  *The generator is a point.*

### 10.35.1 Detailed Description

The generator type.

The documentation for this enum was generated from the following file:

- Generator_Type.java

## 10.36 parma_polyhedra_library.Grid Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Grid.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Grid** (long num_dimensions, Degenerate_Element kind)
- **Grid** (Int8_Box y)
- **Grid** (Int16_Box y)
- **Grid** (Int32_Box y)
- **Grid** (Int64_Box y)
- **Grid** (Uint8_Box y)
- **Grid** (Uint16_Box y)
- **Grid** (Uint32_Box y)
- **Grid** (Uint64_Box y)
- **Grid** (Z_Box y)
- **Grid** (Rational_Box y)
- **Grid** (BD_Shape_int8_t y)
- **Grid** (BD_Shape_int16_t y)
- **Grid** (BD_Shape_int32_t y)
- **Grid** (BD_Shape_int64_t y)
- **Grid** (BD_Shape_mpz_class y)
- **Grid** (BD_Shape_mpq_class y)
- **Grid** (Octagonal_Shape_int8_t y)
- **Grid** (Octagonal_Shape_int16_t y)
- **Grid** (Octagonal_Shape_int32_t y)
- **Grid** (Octagonal_Shape_int64_t y)
- **Grid** (Octagonal_Shape_mpz_class y)
- **Grid** (Octagonal_Shape_mpq_class y)
- **Grid** (C_Polyhedron y)
- **Grid** (NNC_Polyhedron y)
- **Grid** (Grid y)
- **Grid** (Float_Box y)
- **Grid** (BD_Shape_float y)
- **Grid** (Octagonal_Shape_float y)
- **Grid** (Double_Box y)
- **Grid** (BD_Shape_double y)
- **Grid** (Octagonal_Shape_double y)
- **Grid** (Long_Double_Box y)
- **Grid** (BD_Shape_long_double y)
- **Grid** (Octagonal_Shape_long_double y)
- **Grid** (Int8_Box y, Complexity_Class complexity)
- **Grid** (Int16_Box y, Complexity_Class complexity)
- **Grid** (Int32_Box y, Complexity_Class complexity)
- **Grid** (Int64_Box y, Complexity_Class complexity)
- **Grid** (Uint8_Box y, Complexity_Class complexity)
- **Grid** (Uint16_Box y, Complexity_Class complexity)
- **Grid** (Uint32_Box y, Complexity_Class complexity)
- **Grid** (Uint64_Box y, Complexity_Class complexity)

- **Grid** (Z_Box y, Complexity_Class complexity)
- **Grid** (Rational_Box y, Complexity_Class complexity)
- **Grid** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Grid** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Grid** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Grid** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Grid** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Grid** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Grid** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Grid** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Grid** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Grid** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Grid** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Grid** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Grid** (C_Polyhedron y, Complexity_Class complexity)
- **Grid** (NNC_Polyhedron y, Complexity_Class complexity)
- **Grid** (Grid y, Complexity_Class complexity)
- **Grid** (Float_Box y, Complexity_Class complexity)
- **Grid** (BD_Shape_float y, Complexity_Class complexity)
- **Grid** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Grid** (Double_Box y, Complexity_Class complexity)
- **Grid** (BD_Shape_double y, Complexity_Class complexity)
- **Grid** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Grid** (Long_Double_Box y, Complexity_Class complexity)
- **Grid** (BD_Shape_long_double y, Complexity_Class complexity)
- **Grid** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Grid** (Constraint_System cs)
- **Grid** (Congruence_System cs)
- **Grid** (Grid_Generator_System cs)
- native void **swap** (Grid y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Poly_Gen_Relation **relation_with** (Grid_Generator c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Grid_Generator_System **grid_generators** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native Grid_Generator_System **minimized_grid_generators** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)

- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Grid y)
- native boolean **strictly_contains** (Grid y)
- native boolean **is_disjoint_from** (Grid y)
- native boolean **equals** (Grid p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_grid_generator** (Grid_Generator c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **add_grid_generators** (Grid_Generator_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Grid p)
- native void **upper_bound_assign** (Grid p)
- native void **difference_assign** (Grid p)
- native void **concatenate_assign** (Grid p)
- native void **time_elapse_assign** (Grid p)
- native boolean **upper_bound_assign_if_exact** (Grid y)
- native boolean **simplify_using_context_assign** (Grid p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)

- native void **generalized_affine_image_with_congruence** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator, Coefficient modulus)
- native void **generalized_affine_preimage_with_congruence** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator, Coefficient modulus)
- native void **generalized_affine_image_lhs_rhs_with_congruence** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs, Coefficient modulus)
- native void **generalized_affine_preimage_lhs_rhs_with_congruence** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs, Coefficient modulus)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **congruence_widening_assign** (Grid y, By_Reference< Integer > tp)
- native void **generator_widening_assign** (Grid y, By_Reference< Integer > tp)
- native void **widening_assign** (Grid y, By_Reference< Integer > tp)
- native void **limited_congruence_extrapolation_assign** (Grid y, Congruence_System cs, By_Reference< Integer > tp)
- native void **limited_generator_extrapolation_assign** (Grid y, Congruence_System cs, By_Reference< Integer > tp)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Static Public Member Functions

- static native Pair< Grid, Pointset_Powerset_Grid > **approximate_partition** (Grid p, Grid q, By_Reference< Boolean > finite)

### Protected Member Functions

- native void **finalize** ()

#### 10.36.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Grid.

The documentation for this class was generated from the following file:

- Grid.java

## 10.37 parma_polyhedra_library.Grid_Generator Class Reference

A grid line, parameter or grid point.

### Public Member Functions

- Grid_Generator_Type type ()

  *Returns the generator type.*
- Linear_Expression linear_expression ()

  *Returns the linear expression in* `this`.
- Coefficient divisor ()

  *If* `this` *is either a grid point or a parameter, returns its divisor.*
- native String ascii_dump ()

  *Returns an ascii formatted internal representation of* `this`.
- native String toString ()

  *Returns a string representation of* `this`.

### Static Public Member Functions

- static Grid_Generator grid_line (Linear_Expression e)

  *Returns the line of direction* `e`.
- static Grid_Generator parameter (Linear_Expression e, Coefficient d)

  *Returns the parameter at* `e` / `d`.
- static Grid_Generator grid_point (Linear_Expression e, Coefficient d)

  *Returns the point at* `e` / `d`.

### 10.37.1 Detailed Description

A grid line, parameter or grid point.

An object of the class Grid_Generator is one of the following:

- a grid_line;
- a parameter;
- a grid_point.

### 10.37.2 Member Function Documentation

#### 10.37.2.1 static Grid_Generator parma_polyhedra_library.Grid_Generator.grid_line ( Linear_Expression *e* ) [inline], [static]

Returns the line of direction `e`.

#### Exceptions

| | |
|---|---|
| *RuntimeErrorException* | Thrown if the homogeneous part of `e` represents the origin of the vector space. |

#### 10.37.2.2 static Grid_Generator parma_polyhedra_library.Grid_Generator.parameter ( Linear_Expression *e*, Coefficient *d* ) [inline], [static]

Returns the parameter at `e` / `d`.

**Exceptions**

| | |
|---|---|
| *RuntimeErrorException* | Thrown if `d` is zero. |

#### 10.37.2.3 static Grid_Generator parma_polyhedra_library.Grid_Generator.grid_point ( Linear_Expression *e*, Coefficient *d* ) [inline], [static]

Returns the point at `e` / `d`.

**Exceptions**

| | |
|---|---|
| *RuntimeErrorException* | Thrown if `d` is zero. |

#### 10.37.2.4 Coefficient parma_polyhedra_library.Grid_Generator.divisor ( ) [inline]

If `this` is either a grid point or a parameter, returns its divisor.

**Exceptions**

| | |
|---|---|
| *RuntimeErrorException* | Thrown if `this` is a line. |

The documentation for this class was generated from the following file:

- Grid_Generator.java

## 10.38 parma_polyhedra_library.Grid_Generator_System Class Reference

A system of grid generators.

### Public Member Functions

- Grid_Generator_System ()

  *Default constructor: builds an empty system of grid generators.*
- native String ascii_dump ()

  *Returns an ascii formatted internal representation of `this`.*
- native String toString ()

  *Returns a string representation of `this`.*

### 10.38.1 Detailed Description

A system of grid generators.

An object of the class Grid_Generator_System is a system of grid generators, i.e., a multiset of objects of the class Grid_Generator.

The documentation for this class was generated from the following file:

- Grid_Generator_System.java

## 10.39 parma_polyhedra_library.Grid_Generator_Type Enum Reference

The grid generator type.

### Static Public Member Functions

- **[static initializer]**

### Public Attributes

- LINE

  *The generator is a line.*
- PARAMETER

  *The generator is a parameter.*

### 10.39.1 Detailed Description

The grid generator type.

The documentation for this enum was generated from the following file:

- Grid_Generator_Type.java

## 10.40 parma_polyhedra_library.Int16_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Int16_Box.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Int16_Box** (long num_dimensions, Degenerate_Element kind)
- **Int16_Box** (Int8_Box y)
- **Int16_Box** (Int16_Box y)
- **Int16_Box** (Int32_Box y)
- **Int16_Box** (Int64_Box y)
- **Int16_Box** (Uint8_Box y)
- **Int16_Box** (Uint16_Box y)
- **Int16_Box** (Uint32_Box y)
- **Int16_Box** (Uint64_Box y)
- **Int16_Box** (Z_Box y)
- **Int16_Box** (Rational_Box y)
- **Int16_Box** (BD_Shape_int8_t y)
- **Int16_Box** (BD_Shape_int16_t y)
- **Int16_Box** (BD_Shape_int32_t y)
- **Int16_Box** (BD_Shape_int64_t y)
- **Int16_Box** (BD_Shape_mpz_class y)

- **Int16_Box** (BD_Shape_mpq_class y)
- **Int16_Box** (Octagonal_Shape_int8_t y)
- **Int16_Box** (Octagonal_Shape_int16_t y)
- **Int16_Box** (Octagonal_Shape_int32_t y)
- **Int16_Box** (Octagonal_Shape_int64_t y)
- **Int16_Box** (Octagonal_Shape_mpz_class y)
- **Int16_Box** (Octagonal_Shape_mpq_class y)
- **Int16_Box** (C_Polyhedron y)
- **Int16_Box** (NNC_Polyhedron y)
- **Int16_Box** (Grid y)
- **Int16_Box** (Float_Box y)
- **Int16_Box** (BD_Shape_float y)
- **Int16_Box** (Octagonal_Shape_float y)
- **Int16_Box** (Double_Box y)
- **Int16_Box** (BD_Shape_double y)
- **Int16_Box** (Octagonal_Shape_double y)
- **Int16_Box** (Long_Double_Box y)
- **Int16_Box** (BD_Shape_long_double y)
- **Int16_Box** (Octagonal_Shape_long_double y)
- **Int16_Box** (Int8_Box y, Complexity_Class complexity)
- **Int16_Box** (Int16_Box y, Complexity_Class complexity)
- **Int16_Box** (Int32_Box y, Complexity_Class complexity)
- **Int16_Box** (Int64_Box y, Complexity_Class complexity)
- **Int16_Box** (Uint8_Box y, Complexity_Class complexity)
- **Int16_Box** (Uint16_Box y, Complexity_Class complexity)
- **Int16_Box** (Uint32_Box y, Complexity_Class complexity)
- **Int16_Box** (Uint64_Box y, Complexity_Class complexity)
- **Int16_Box** (Z_Box y, Complexity_Class complexity)
- **Int16_Box** (Rational_Box y, Complexity_Class complexity)
- **Int16_Box** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Int16_Box** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Int16_Box** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Int16_Box** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Int16_Box** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Int16_Box** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Int16_Box** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Int16_Box** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Int16_Box** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Int16_Box** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Int16_Box** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Int16_Box** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Int16_Box** (C_Polyhedron y, Complexity_Class complexity)
- **Int16_Box** (NNC_Polyhedron y, Complexity_Class complexity)
- **Int16_Box** (Grid y, Complexity_Class complexity)
- **Int16_Box** (Float_Box y, Complexity_Class complexity)
- **Int16_Box** (BD_Shape_float y, Complexity_Class complexity)
- **Int16_Box** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Int16_Box** (Double_Box y, Complexity_Class complexity)
- **Int16_Box** (BD_Shape_double y, Complexity_Class complexity)
- **Int16_Box** (Octagonal_Shape_double y, Complexity_Class complexity)

- **Int16_Box** (Long_Double_Box y, Complexity_Class complexity)
- **Int16_Box** (BD_Shape_long_double y, Complexity_Class complexity)
- **Int16_Box** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Int16_Box** (Constraint_System cs)
- **Int16_Box** (Congruence_System cs)
- **Int16_Box** (Generator_System cs)
- native void **swap** (Int16_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **has_upper_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_Reference< Boolean > closed)
- native boolean **has_lower_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_Reference< Boolean > closed)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Int16_Box y)
- native boolean **strictly_contains** (Int16_Box y)
- native boolean **is_disjoint_from** (Int16_Box y)
- native boolean **equals** (Int16_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)

- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Int16_Box p)
- native void **upper_bound_assign** (Int16_Box p)
- native void **difference_assign** (Int16_Box p)
- native void **concatenate_assign** (Int16_Box p)
- native void **time_elapse_assign** (Int16_Box p)
- native boolean **upper_bound_assign_if_exact** (Int16_Box y)
- native boolean **simplify_using_context_assign** (Int16_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **CC76_widening_assign** (Int16_Box y, By_Reference< Integer > tp)
- native void **widening_assign** (Int16_Box y, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Int16_Box y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Int16_Box arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_-Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity-_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair< Int16_Box, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Int16_Box p, Int16_Box q)

#### Protected Member Functions

- native void **finalize** ()

### 10.40.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Int16_Box.

The documentation for this class was generated from the following file:

- Int16_Box.java

## 10.41 parma_polyhedra_library.Int32_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Int32_Box.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Int32_Box** (long num_dimensions, Degenerate_Element kind)
- **Int32_Box** (Int8_Box y)
- **Int32_Box** (Int16_Box y)
- **Int32_Box** (Int32_Box y)
- **Int32_Box** (Int64_Box y)
- **Int32_Box** (Uint8_Box y)
- **Int32_Box** (Uint16_Box y)
- **Int32_Box** (Uint32_Box y)
- **Int32_Box** (Uint64_Box y)
- **Int32_Box** (Z_Box y)
- **Int32_Box** (Rational_Box y)
- **Int32_Box** (BD_Shape_int8_t y)
- **Int32_Box** (BD_Shape_int16_t y)
- **Int32_Box** (BD_Shape_int32_t y)
- **Int32_Box** (BD_Shape_int64_t y)
- **Int32_Box** (BD_Shape_mpz_class y)
- **Int32_Box** (BD_Shape_mpq_class y)
- **Int32_Box** (Octagonal_Shape_int8_t y)
- **Int32_Box** (Octagonal_Shape_int16_t y)
- **Int32_Box** (Octagonal_Shape_int32_t y)
- **Int32_Box** (Octagonal_Shape_int64_t y)
- **Int32_Box** (Octagonal_Shape_mpz_class y)
- **Int32_Box** (Octagonal_Shape_mpq_class y)
- **Int32_Box** (C_Polyhedron y)
- **Int32_Box** (NNC_Polyhedron y)

- **Int32_Box** (Grid y)
- **Int32_Box** (Float_Box y)
- **Int32_Box** (BD_Shape_float y)
- **Int32_Box** (Octagonal_Shape_float y)
- **Int32_Box** (Double_Box y)
- **Int32_Box** (BD_Shape_double y)
- **Int32_Box** (Octagonal_Shape_double y)
- **Int32_Box** (Long_Double_Box y)
- **Int32_Box** (BD_Shape_long_double y)
- **Int32_Box** (Octagonal_Shape_long_double y)
- **Int32_Box** (Int8_Box y, Complexity_Class complexity)
- **Int32_Box** (Int16_Box y, Complexity_Class complexity)
- **Int32_Box** (Int32_Box y, Complexity_Class complexity)
- **Int32_Box** (Int64_Box y, Complexity_Class complexity)
- **Int32_Box** (Uint8_Box y, Complexity_Class complexity)
- **Int32_Box** (Uint16_Box y, Complexity_Class complexity)
- **Int32_Box** (Uint32_Box y, Complexity_Class complexity)
- **Int32_Box** (Uint64_Box y, Complexity_Class complexity)
- **Int32_Box** (Z_Box y, Complexity_Class complexity)
- **Int32_Box** (Rational_Box y, Complexity_Class complexity)
- **Int32_Box** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Int32_Box** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Int32_Box** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Int32_Box** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Int32_Box** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Int32_Box** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Int32_Box** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Int32_Box** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Int32_Box** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Int32_Box** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Int32_Box** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Int32_Box** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Int32_Box** (C_Polyhedron y, Complexity_Class complexity)
- **Int32_Box** (NNC_Polyhedron y, Complexity_Class complexity)
- **Int32_Box** (Grid y, Complexity_Class complexity)
- **Int32_Box** (Float_Box y, Complexity_Class complexity)
- **Int32_Box** (BD_Shape_float y, Complexity_Class complexity)
- **Int32_Box** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Int32_Box** (Double_Box y, Complexity_Class complexity)
- **Int32_Box** (BD_Shape_double y, Complexity_Class complexity)
- **Int32_Box** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Int32_Box** (Long_Double_Box y, Complexity_Class complexity)
- **Int32_Box** (BD_Shape_long_double y, Complexity_Class complexity)
- **Int32_Box** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Int32_Box** (Constraint_System cs)
- **Int32_Box** (Congruence_System cs)
- **Int32_Box** (Generator_System cs)
- native void **swap** (Int32_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()

- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **has_upper_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)
- native boolean **has_lower_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Int32_Box y)
- native boolean **strictly_contains** (Int32_Box y)
- native boolean **is_disjoint_from** (Int32_Box y)
- native boolean **equals** (Int32_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Int32_Box p)
- native void **upper_bound_assign** (Int32_Box p)
- native void **difference_assign** (Int32_Box p)
- native void **concatenate_assign** (Int32_Box p)
- native void **time_elapse_assign** (Int32_Box p)
- native boolean **upper_bound_assign_if_exact** (Int32_Box y)
- native boolean **simplify_using_context_assign** (Int32_Box p)

- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **CC76_widening_assign** (Int32_Box y, By_Reference< Integer > tp)
- native void **widening_assign** (Int32_Box y, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Int32_Box y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Int32_Box arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_-Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity-_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Static Public Member Functions

- static native Pair< Int32_Box, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Int32_Box p, Int32_Box q)

### Protected Member Functions

- native void **finalize** ()

### 10.41.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Int32_Box.

The documentation for this class was generated from the following file:

- Int32_Box.java

## 10.42 parma_polyhedra_library.Int64_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Int64_Box.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Int64_Box** (long num_dimensions, Degenerate_Element kind)
- **Int64_Box** (Int8_Box y)
- **Int64_Box** (Int16_Box y)
- **Int64_Box** (Int32_Box y)
- **Int64_Box** (Int64_Box y)
- **Int64_Box** (Uint8_Box y)
- **Int64_Box** (Uint16_Box y)
- **Int64_Box** (Uint32_Box y)
- **Int64_Box** (Uint64_Box y)
- **Int64_Box** (Z_Box y)
- **Int64_Box** (Rational_Box y)
- **Int64_Box** (BD_Shape_int8_t y)
- **Int64_Box** (BD_Shape_int16_t y)
- **Int64_Box** (BD_Shape_int32_t y)
- **Int64_Box** (BD_Shape_int64_t y)
- **Int64_Box** (BD_Shape_mpz_class y)
- **Int64_Box** (BD_Shape_mpq_class y)
- **Int64_Box** (Octagonal_Shape_int8_t y)
- **Int64_Box** (Octagonal_Shape_int16_t y)
- **Int64_Box** (Octagonal_Shape_int32_t y)
- **Int64_Box** (Octagonal_Shape_int64_t y)
- **Int64_Box** (Octagonal_Shape_mpz_class y)
- **Int64_Box** (Octagonal_Shape_mpq_class y)
- **Int64_Box** (C_Polyhedron y)
- **Int64_Box** (NNC_Polyhedron y)
- **Int64_Box** (Grid y)
- **Int64_Box** (Float_Box y)
- **Int64_Box** (BD_Shape_float y)
- **Int64_Box** (Octagonal_Shape_float y)
- **Int64_Box** (Double_Box y)
- **Int64_Box** (BD_Shape_double y)
- **Int64_Box** (Octagonal_Shape_double y)
- **Int64_Box** (Long_Double_Box y)
- **Int64_Box** (BD_Shape_long_double y)
- **Int64_Box** (Octagonal_Shape_long_double y)

- **Int64_Box** (Int8_Box y, Complexity_Class complexity)
- **Int64_Box** (Int16_Box y, Complexity_Class complexity)
- **Int64_Box** (Int32_Box y, Complexity_Class complexity)
- **Int64_Box** (Int64_Box y, Complexity_Class complexity)
- **Int64_Box** (Uint8_Box y, Complexity_Class complexity)
- **Int64_Box** (Uint16_Box y, Complexity_Class complexity)
- **Int64_Box** (Uint32_Box y, Complexity_Class complexity)
- **Int64_Box** (Uint64_Box y, Complexity_Class complexity)
- **Int64_Box** (Z_Box y, Complexity_Class complexity)
- **Int64_Box** (Rational_Box y, Complexity_Class complexity)
- **Int64_Box** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Int64_Box** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Int64_Box** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Int64_Box** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Int64_Box** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Int64_Box** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Int64_Box** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Int64_Box** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Int64_Box** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Int64_Box** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Int64_Box** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Int64_Box** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Int64_Box** (C_Polyhedron y, Complexity_Class complexity)
- **Int64_Box** (NNC_Polyhedron y, Complexity_Class complexity)
- **Int64_Box** (Grid y, Complexity_Class complexity)
- **Int64_Box** (Float_Box y, Complexity_Class complexity)
- **Int64_Box** (BD_Shape_float y, Complexity_Class complexity)
- **Int64_Box** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Int64_Box** (Double_Box y, Complexity_Class complexity)
- **Int64_Box** (BD_Shape_double y, Complexity_Class complexity)
- **Int64_Box** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Int64_Box** (Long_Double_Box y, Complexity_Class complexity)
- **Int64_Box** (BD_Shape_long_double y, Complexity_Class complexity)
- **Int64_Box** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Int64_Box** (Constraint_System cs)
- **Int64_Box** (Congruence_System cs)
- **Int64_Box** (Generator_System cs)
- native void **swap** (Int64_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()

- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **has_upper_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)
- native boolean **has_lower_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Int64_Box y)
- native boolean **strictly_contains** (Int64_Box y)
- native boolean **is_disjoint_from** (Int64_Box y)
- native boolean **equals** (Int64_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Int64_Box p)
- native void **upper_bound_assign** (Int64_Box p)
- native void **difference_assign** (Int64_Box p)
- native void **concatenate_assign** (Int64_Box p)
- native void **time_elapse_assign** (Int64_Box p)
- native boolean **upper_bound_assign_if_exact** (Int64_Box y)
- native boolean **simplify_using_context_assign** (Int64_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)

- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **CC76_widening_assign** (Int64_Box y, By_Reference< Integer > tp)
- native void **widening_assign** (Int64_Box y, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Int64_Box y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Int64_Box arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair< Int64_Box, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Int64_Box p, Int64_Box q)

#### Protected Member Functions

- native void **finalize** ()

### 10.42.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Int64_Box.

The documentation for this class was generated from the following file:

- Int64_Box.java

## 10.43 parma_polyhedra_library.Int8_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Int8_Box.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Int8_Box** (long num_dimensions, Degenerate_Element kind)
- **Int8_Box** (Int8_Box y)
- **Int8_Box** (Int16_Box y)
- **Int8_Box** (Int32_Box y)
- **Int8_Box** (Int64_Box y)
- **Int8_Box** (Uint8_Box y)
- **Int8_Box** (Uint16_Box y)
- **Int8_Box** (Uint32_Box y)
- **Int8_Box** (Uint64_Box y)
- **Int8_Box** (Z_Box y)
- **Int8_Box** (Rational_Box y)
- **Int8_Box** (BD_Shape_int8_t y)
- **Int8_Box** (BD_Shape_int16_t y)
- **Int8_Box** (BD_Shape_int32_t y)
- **Int8_Box** (BD_Shape_int64_t y)
- **Int8_Box** (BD_Shape_mpz_class y)
- **Int8_Box** (BD_Shape_mpq_class y)
- **Int8_Box** (Octagonal_Shape_int8_t y)
- **Int8_Box** (Octagonal_Shape_int16_t y)
- **Int8_Box** (Octagonal_Shape_int32_t y)
- **Int8_Box** (Octagonal_Shape_int64_t y)
- **Int8_Box** (Octagonal_Shape_mpz_class y)
- **Int8_Box** (Octagonal_Shape_mpq_class y)
- **Int8_Box** (C_Polyhedron y)
- **Int8_Box** (NNC_Polyhedron y)
- **Int8_Box** (Grid y)
- **Int8_Box** (Float_Box y)
- **Int8_Box** (BD_Shape_float y)
- **Int8_Box** (Octagonal_Shape_float y)
- **Int8_Box** (Double_Box y)
- **Int8_Box** (BD_Shape_double y)
- **Int8_Box** (Octagonal_Shape_double y)
- **Int8_Box** (Long_Double_Box y)
- **Int8_Box** (BD_Shape_long_double y)
- **Int8_Box** (Octagonal_Shape_long_double y)
- **Int8_Box** (Int8_Box y, Complexity_Class complexity)
- **Int8_Box** (Int16_Box y, Complexity_Class complexity)
- **Int8_Box** (Int32_Box y, Complexity_Class complexity)
- **Int8_Box** (Int64_Box y, Complexity_Class complexity)
- **Int8_Box** (Uint8_Box y, Complexity_Class complexity)
- **Int8_Box** (Uint16_Box y, Complexity_Class complexity)
- **Int8_Box** (Uint32_Box y, Complexity_Class complexity)
- **Int8_Box** (Uint64_Box y, Complexity_Class complexity)

- **Int8_Box** (Z_Box y, Complexity_Class complexity)
- **Int8_Box** (Rational_Box y, Complexity_Class complexity)
- **Int8_Box** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Int8_Box** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Int8_Box** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Int8_Box** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Int8_Box** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Int8_Box** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Int8_Box** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Int8_Box** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Int8_Box** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Int8_Box** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Int8_Box** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Int8_Box** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Int8_Box** (C_Polyhedron y, Complexity_Class complexity)
- **Int8_Box** (NNC_Polyhedron y, Complexity_Class complexity)
- **Int8_Box** (Grid y, Complexity_Class complexity)
- **Int8_Box** (Float_Box y, Complexity_Class complexity)
- **Int8_Box** (BD_Shape_float y, Complexity_Class complexity)
- **Int8_Box** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Int8_Box** (Double_Box y, Complexity_Class complexity)
- **Int8_Box** (BD_Shape_double y, Complexity_Class complexity)
- **Int8_Box** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Int8_Box** (Long_Double_Box y, Complexity_Class complexity)
- **Int8_Box** (BD_Shape_long_double y, Complexity_Class complexity)
- **Int8_Box** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Int8_Box** (Constraint_System cs)
- **Int8_Box** (Congruence_System cs)
- **Int8_Box** (Generator_System cs)
- native void **swap** (Int8_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **has_upper_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)

- native boolean **has_lower_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_Reference< Boolean > closed)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Int8_Box y)
- native boolean **strictly_contains** (Int8_Box y)
- native boolean **is_disjoint_from** (Int8_Box y)
- native boolean **equals** (Int8_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Int8_Box p)
- native void **upper_bound_assign** (Int8_Box p)
- native void **difference_assign** (Int8_Box p)
- native void **concatenate_assign** (Int8_Box p)
- native void **time_elapse_assign** (Int8_Box p)
- native boolean **upper_bound_assign_if_exact** (Int8_Box y)
- native boolean **simplify_using_context_assign** (Int8_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)

- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **CC76_widening_assign** (Int8_Box y, By_Reference< Integer > tp)
- native void **widening_assign** (Int8_Box y, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Int8_Box y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Int8_Box arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair< Int8_Box, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Int8_Box p, Int8_Box q)

#### Protected Member Functions

- native void **finalize** ()

### 10.43.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Int8_Box.

The documentation for this class was generated from the following file:

- Int8_Box.java

## 10.44 parma_polyhedra_library.Invalid_Argument_Exception Class Reference

Exceptions caused by invalid arguments.

#### Public Member Functions

- Invalid_Argument_Exception (String s)

  *Constructor.*

### 10.44.1 Detailed Description

Exceptions caused by invalid arguments.

The documentation for this class was generated from the following file:

- Invalid_Argument_Exception.java

## 10.45 parma_polyhedra_library.IO Class Reference

A class collecting I/O functions.

### Static Public Member Functions

- static native String wrap_string (String str, int indent_depth, int preferred_first_line_length, int preferred_line_length)

  *Utility function for the wrapping of lines of text.*

### 10.45.1 Detailed Description

A class collecting I/O functions.

### 10.45.2 Member Function Documentation

#### 10.45.2.1 static native String parma_polyhedra_library.IO.wrap_string ( String *str,* int *indent_depth,* int *preferred_first_line_length,* int *preferred_line_length* ) [static]

Utility function for the wrapping of lines of text.

**Parameters**

| | |
|---|---|
| *str* | The source string holding the lines to wrap. |
| *indent_depth* | The indentation depth. |
| *preferred_first_line_length* | The preferred length for the first line of text. |
| *preferred_line_length* | The preferred length for all the lines but the first one. |

**Returns**

The wrapped string.

The documentation for this class was generated from the following file:

- IO.java

## 10.46 parma_polyhedra_library.Length_Error_Exception Class Reference

Exceptions caused by too big length/size values.

### Public Member Functions

- Length_Error_Exception (String s)

  *Constructor.*

#### 10.46.1 Detailed Description

Exceptions caused by too big length/size values.

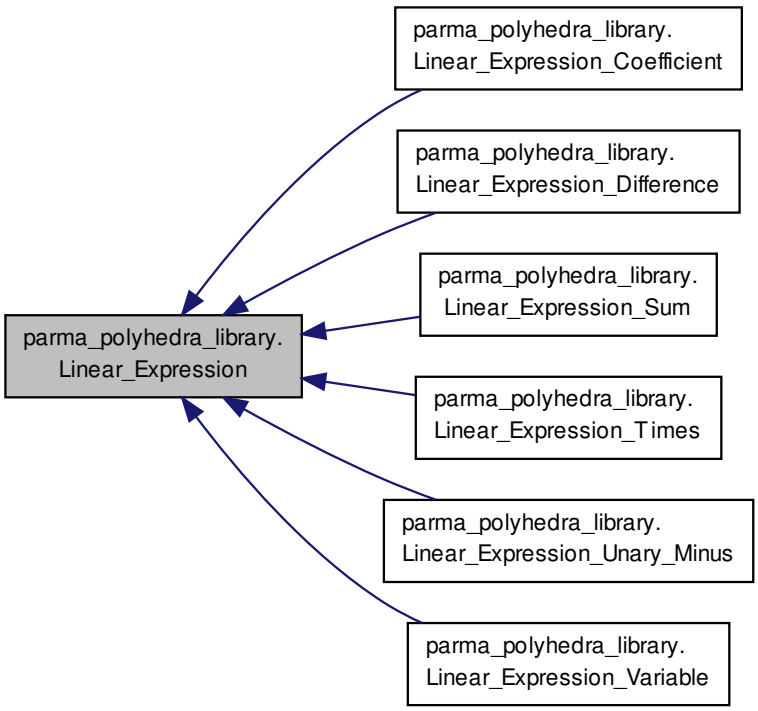
The documentation for this class was generated from the following file:

- Length_Error_Exception.java

## 10.47 parma_polyhedra_library.Linear_Expression Class Reference

A linear expression.

Inheritance diagram for parma_polyhedra_library.Linear_Expression:




### Public Member Functions

- Linear_Expression sum (Linear_Expression y)

  *Returns the sum of* `this` *and* `y`.

- Linear_Expression subtract (Linear_Expression y)

  *Returns the difference of* `this` *and* `y`.
- Linear_Expression times (Coefficient c)

  *Returns the product of* `this` *times* `c`.
- Linear_Expression unary_minus ()

  *Returns the negation of* `this`.
- abstract Linear_Expression clone ()

  *Returns a copy of the linear expression.*
- native String ascii_dump ()

  *Returns an ascii formatted internal representation of* `this`.
- native String toString ()

  *Returns a string representation of* `this`.
- native boolean is_zero ()

  *Returns* `true` *if and only if* `this` *is* 0.
- native boolean all_homogeneous_terms_are_zero ()

  *Returns* `true` *if and only if all the homogeneous terms of* `this` *are* 0.

### 10.47.1 Detailed Description

A linear expression.

An object of the class Linear_Expression represents a linear expression that can be built from a Linear_Expression_Variable, Linear_Expression_Coefficient, Linear_Expression_Sum, Linear_Expression_Difference, Linear_Expression_Unary_Minus.

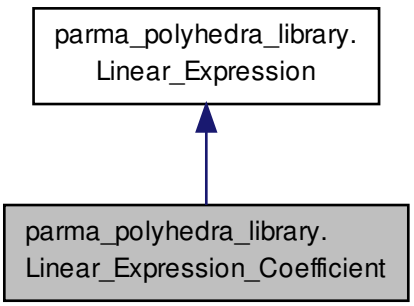
The documentation for this class was generated from the following file:

- Linear_Expression.java

## 10.48 parma_polyhedra_library.Linear_Expression_Coefficient Class Reference

A linear expression built from a coefficient.

Inheritance diagram for parma_polyhedra_library.Linear_Expression_Coefficient:



#### Public Member Functions

- Linear_Expression_Coefficient (Coefficient c)

  *Builds the object corresponding to a copy of the coefficient $c$.*
- Coefficient argument ()

  *Returns coefficient representing the linear expression.*
- Linear_Expression_Coefficient clone ()

  *Builds a copy of this.*

#### Protected Attributes

- Coefficient coeff

  *The coefficient representing the linear expression.*

### 10.48.1 Detailed Description

A linear expression built from a coefficient.

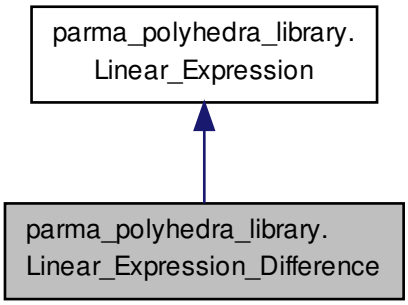
The documentation for this class was generated from the following file:

- Linear_Expression_Coefficient.java

## 10.49 parma_polyhedra_library.Linear_Expression_Difference Class Reference

The difference of two linear expressions.

Inheritance diagram for parma_polyhedra_library.Linear_Expression_Difference:




#### Public Member Functions

- Linear_Expression_Difference (Linear_Expression x, Linear_Expression y)

  *Builds an object that represents the difference of the copy $x$ and $y$.*

- Linear_Expression left_hand_side ()

  *Returns the left hand side of* `this`.
- Linear_Expression right_hand_side ()

  *Returns the left hand side of* `this`.
- Linear_Expression_Difference clone ()

  *Builds a copy of this.*

#### Protected Attributes

- Linear_Expression lhs

  *The value of the left hand side of* `this`.
- Linear_Expression rhs

  *The value of the right hand side of* `this`.

### 10.49.1 Detailed Description

The difference of two linear expressions.

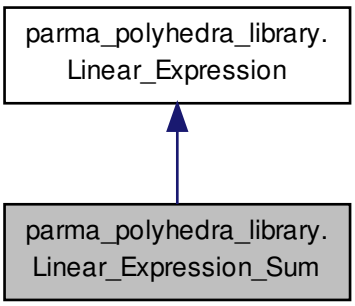
The documentation for this class was generated from the following file:

- Linear_Expression_Difference.java

## 10.50 parma_polyhedra_library.Linear_Expression_Sum Class Reference

The sum of two linear expressions.

Inheritance diagram for parma_polyhedra_library.Linear_Expression_Sum:




#### Public Member Functions

- Linear_Expression_Sum (Linear_Expression x, Linear_Expression y)

  *Builds an object that represents the sum of the copy of* `x` *and* `y`.

- Linear_Expression left_hand_side ()

  *Returns the left hand side of* `this`.
- Linear_Expression right_hand_side ()

  *Returns the right hand side of* `this`.
- Linear_Expression_Sum clone ()

  *Builds a copy of this.*

#### Protected Attributes

- Linear_Expression lhs

  *The value of the left hand side of* `this`.
- Linear_Expression rhs

  *The value of the right hand side of* `this`.

### 10.50.1 Detailed Description

The sum of two linear expressions.

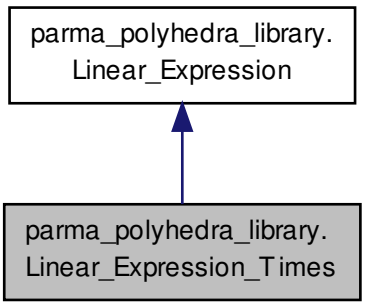
The documentation for this class was generated from the following file:

- Linear_Expression_Sum.java

## 10.51 parma_polyhedra_library.Linear_Expression_Times Class Reference

The product of a linear expression and a coefficient.

Inheritance diagram for parma_polyhedra_library.Linear_Expression_Times:




#### Public Member Functions

- Linear_Expression_Times (Coefficient c, Variable v)

  *Builds an object cloning the input arguments.*

- Linear_Expression_Times (Coefficient c, Linear_Expression l)

  *Builds an object cloning the input arguments.*
- Linear_Expression_Times (Linear_Expression l, Coefficient c)

  *Builds an object cloning the input arguments.*
- Coefficient coefficient ()

  *Returns the coefficient of* `this`.
- Linear_Expression linear_expression ()

  *Returns the linear expression subobject of* `this`.
- Linear_Expression_Times clone ()

  *Builds a copy of this.*

#### Protected Attributes

- Coefficient coeff

  *The value of the coefficient.*
- Linear_Expression lin_expr

  *The value of the inner linear expression.*

### 10.51.1 Detailed Description

The product of a linear expression and a coefficient.

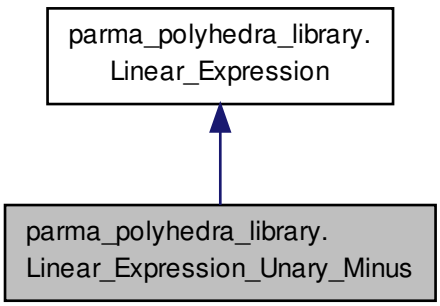
The documentation for this class was generated from the following file:

- Linear_Expression_Times.java

## 10.52 parma_polyhedra_library.Linear_Expression_Unary_Minus Class Reference

The negation of a linear expression.

Inheritance diagram for parma_polyhedra_library.Linear_Expression_Unary_Minus:



#### Public Member Functions

- Linear_Expression_Unary_Minus (Linear_Expression x)

  *Builds an object that represents the negation of the copy* `x`*.*
- Linear_Expression argument ()

  *Returns the value that* `this` *negates.*
- Linear_Expression_Unary_Minus clone ()

  *Builds a copy of this.*

#### Protected Attributes

- Linear_Expression arg

  *The value that* `this` *negates.*

### 10.52.1 Detailed Description

The negation of a linear expression.

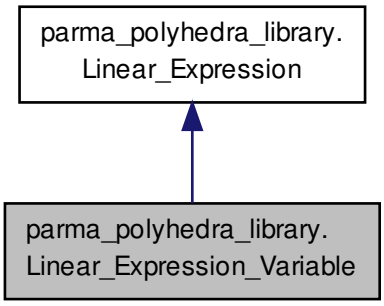
The documentation for this class was generated from the following file:

- Linear_Expression_Unary_Minus.java

## 10.53 parma_polyhedra_library.Linear_Expression_Variable Class Reference

A linear expression built from a variable.

Inheritance diagram for parma_polyhedra_library.Linear_Expression_Variable:




#### Public Member Functions

- Linear_Expression_Variable (Variable v)

  *Builds the object associated to the copy of* `v`*.*

- Variable argument ()

  *Returns the variable representing the linear expression.*
- Linear_Expression_Variable clone ()

  *Builds a copy of this.*

#### Protected Attributes

- Variable **arg**

### 10.53.1 Detailed Description

A linear expression built from a variable.

The documentation for this class was generated from the following file:

- Linear_Expression_Variable.java

## 10.54 parma_polyhedra_library.Logic_Error_Exception Class Reference

Exceptions due to errors in low-level routines.

#### Public Member Functions

- Logic_Error_Exception (String s)

  *Constructor.*

### 10.54.1 Detailed Description

Exceptions due to errors in low-level routines.

These exceptions may be generated, for instance, by the inability of querying/controlling the FPU behavior with respect to rounding modes.

The documentation for this class was generated from the following file:

- Logic_Error_Exception.java

## 10.55 parma_polyhedra_library.Long_Double_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Long_Double_Box.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Long_Double_Box** (long num_dimensions, Degenerate_Element kind)
- **Long_Double_Box** (Int8_Box y)
- **Long_Double_Box** (Int16_Box y)
- **Long_Double_Box** (Int32_Box y)

- **Long_Double_Box** (Int64_Box y)
- **Long_Double_Box** (Uint8_Box y)
- **Long_Double_Box** (Uint16_Box y)
- **Long_Double_Box** (Uint32_Box y)
- **Long_Double_Box** (Uint64_Box y)
- **Long_Double_Box** (Z_Box y)
- **Long_Double_Box** (Rational_Box y)
- **Long_Double_Box** (BD_Shape_int8_t y)
- **Long_Double_Box** (BD_Shape_int16_t y)
- **Long_Double_Box** (BD_Shape_int32_t y)
- **Long_Double_Box** (BD_Shape_int64_t y)
- **Long_Double_Box** (BD_Shape_mpz_class y)
- **Long_Double_Box** (BD_Shape_mpq_class y)
- **Long_Double_Box** (Octagonal_Shape_int8_t y)
- **Long_Double_Box** (Octagonal_Shape_int16_t y)
- **Long_Double_Box** (Octagonal_Shape_int32_t y)
- **Long_Double_Box** (Octagonal_Shape_int64_t y)
- **Long_Double_Box** (Octagonal_Shape_mpz_class y)
- **Long_Double_Box** (Octagonal_Shape_mpq_class y)
- **Long_Double_Box** (C_Polyhedron y)
- **Long_Double_Box** (NNC_Polyhedron y)
- **Long_Double_Box** (Grid y)
- **Long_Double_Box** (Float_Box y)
- **Long_Double_Box** (BD_Shape_float y)
- **Long_Double_Box** (Octagonal_Shape_float y)
- **Long_Double_Box** (Double_Box y)
- **Long_Double_Box** (BD_Shape_double y)
- **Long_Double_Box** (Octagonal_Shape_double y)
- **Long_Double_Box** (Long_Double_Box y)
- **Long_Double_Box** (BD_Shape_long_double y)
- **Long_Double_Box** (Octagonal_Shape_long_double y)
- **Long_Double_Box** (Int8_Box y, Complexity_Class complexity)
- **Long_Double_Box** (Int16_Box y, Complexity_Class complexity)
- **Long_Double_Box** (Int32_Box y, Complexity_Class complexity)
- **Long_Double_Box** (Int64_Box y, Complexity_Class complexity)
- **Long_Double_Box** (Uint8_Box y, Complexity_Class complexity)
- **Long_Double_Box** (Uint16_Box y, Complexity_Class complexity)
- **Long_Double_Box** (Uint32_Box y, Complexity_Class complexity)
- **Long_Double_Box** (Uint64_Box y, Complexity_Class complexity)
- **Long_Double_Box** (Z_Box y, Complexity_Class complexity)
- **Long_Double_Box** (Rational_Box y, Complexity_Class complexity)
- **Long_Double_Box** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Long_Double_Box** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Long_Double_Box** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Long_Double_Box** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Long_Double_Box** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Long_Double_Box** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Long_Double_Box** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Long_Double_Box** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Long_Double_Box** (Octagonal_Shape_int32_t y, Complexity_Class complexity)

- **Long_Double_Box** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Long_Double_Box** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Long_Double_Box** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Long_Double_Box** (C_Polyhedron y, Complexity_Class complexity)
- **Long_Double_Box** (NNC_Polyhedron y, Complexity_Class complexity)
- **Long_Double_Box** (Grid y, Complexity_Class complexity)
- **Long_Double_Box** (Float_Box y, Complexity_Class complexity)
- **Long_Double_Box** (BD_Shape_float y, Complexity_Class complexity)
- **Long_Double_Box** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Long_Double_Box** (Double_Box y, Complexity_Class complexity)
- **Long_Double_Box** (BD_Shape_double y, Complexity_Class complexity)
- **Long_Double_Box** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Long_Double_Box** (Long_Double_Box y, Complexity_Class complexity)
- **Long_Double_Box** (BD_Shape_long_double y, Complexity_Class complexity)
- **Long_Double_Box** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Long_Double_Box** (Constraint_System cs)
- **Long_Double_Box** (Congruence_System cs)
- **Long_Double_Box** (Generator_System cs)
- native void **swap** (Long_Double_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **has_upper_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_Reference< Boolean > closed)
- native boolean **has_lower_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_Reference< Boolean > closed)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)

- native boolean **contains** (Long_Double_Box y)
- native boolean **strictly_contains** (Long_Double_Box y)
- native boolean **is_disjoint_from** (Long_Double_Box y)
- native boolean **equals** (Long_Double_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Long_Double_Box p)
- native void **upper_bound_assign** (Long_Double_Box p)
- native void **difference_assign** (Long_Double_Box p)
- native void **concatenate_assign** (Long_Double_Box p)
- native void **time_elapse_assign** (Long_Double_Box p)
- native boolean **upper_bound_assign_if_exact** (Long_Double_Box y)
- native boolean **simplify_using_context_assign** (Long_Double_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()

- native void **CC76_widening_assign** (Long_Double_Box y, By_Reference< Integer > tp)
- native void **widening_assign** (Long_Double_Box y, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Long_Double_Box y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Long_Double_Box arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair < Long_Double_Box, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Long_Double_Box p, Long_Double_Box q)

#### Protected Member Functions

- native void **finalize** ()

### 10.55.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Long_Double_Box.

The documentation for this class was generated from the following file:

- Long_Double_Box.java

## 10.56 parma_polyhedra_library.MIP_Problem Class Reference

A Mixed Integer (linear) Programming problem.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

**Functions that Do Not Modify the MIP_Problem**

- native long max_space_dimension ()

  *Returns the maximum space dimension an MIP_Problem can handle.*
- native long space_dimension ()

  *Returns the space dimension of the MIP problem.*
- native Variables_Set integer_space_dimensions ()

  *Returns a set containing all the variables' indexes constrained to be integral.*
- native Constraint_System constraints ()

  *Returns the constraints .*
- native Linear_Expression objective_function ()

*Returns the objective function.*

- native Optimization_Mode optimization_mode ()

  *Returns the optimization mode.*
- native String ascii_dump ()

  *Returns an ascii formatted internal representation of* `this`.
- native String toString ()

  *Returns a string representation of* `this`.
- native long total_memory_in_bytes ()

  *Returns the total size in bytes of the memory occupied by the underlying C++ object.*
- native boolean OK ()

  *Checks if all the invariants are satisfied.*

### Functions that May Modify the MIP_Problem

- native void clear ()

  *Resets* `this` *to be equal to the trivial MIP problem.*
- native void add_space_dimensions_and_embed (long m)

  *Adds* `m` *new space dimensions and embeds the old MIP problem in the new vector space.*
- native void add_to_integer_space_dimensions (Variables_Set i_vars)

  *Sets the variables whose indexes are in set* `i_vars` *to be integer space dimensions.*
- native void add_constraint (Constraint c)

  *Adds a copy of constraint* `c` *to the MIP problem.*
- native void add_constraints (Constraint_System cs)

  *Adds a copy of the constraints in* `cs` *to the MIP problem.*
- native void set_objective_function (Linear_Expression obj)

  *Sets the objective function to* `obj`.
- native void set_optimization_mode (Optimization_Mode mode)

  *Sets the optimization mode to* `mode`.

### Computing the Solution of the MIP_Problem

- native boolean is_satisfiable ()

  *Checks satisfiability of* `this`.
- native MIP_Problem_Status solve ()

  *Optimizes the MIP problem.*
- native void evaluate_objective_function (Generator evaluating_point, Coefficient num, Coefficient den)

  *Sets* `num` *and* `den` *so that* $\frac{num}{den}$ *is the result of evaluating the objective function on* `evaluating_point`.
- native Generator feasible_point ()

  *Returns a feasible point for* `this`*, if it exists.*
- native Generator optimizing_point ()

  *Returns an optimal point for* `this`*, if it exists.*
- native void optimal_value (Coefficient num, Coefficient den)

  *Sets* `num` *and* `den` *so that* $\frac{num}{den}$ *is the solution of the optimization problem.*

### Querying/Setting Control Parameters

- native Control_Parameter_Value get_control_parameter (Control_Parameter_Name name)

  *Returns the value of control parameter* `name`.
- native void set_control_parameter (Control_Parameter_Value value)

  *Sets control parameter* `value`.

### Constructors and Destructor

- MIP_Problem (long dim)

  *Builds a trivial MIP problem.*
- MIP_Problem (long dim, Constraint_System cs, Linear_Expression obj, Optimization_Mode mode)

  *Builds an MIP problem having space dimension* `dim` *from the constraint system* `cs`*, the objective function* `obj` *and optimization mode* `mode`*.*
- MIP_Problem (MIP_Problem y)

  *Builds a copy of* `y`*.*
- native void free ()

  *Releases all resources managed by* `this`*, also resetting it to a null reference.*
- native void finalize ()

  *Releases all resources managed by* `this`*.*

### Additional Inherited Members

## 10.56.1 Detailed Description

A Mixed Integer (linear) Programming problem.

An object of this class encodes a mixed integer (linear) programming problem. The MIP problem is specified by providing:

- the dimension of the vector space;
- the feasible region, by means of a finite set of linear equality and non-strict inequality constraints;
- the subset of the unknown variables that range over the integers (the other variables implicitly ranging over the reals);
- the objective function, described by a Linear_Expression;
- the optimization mode (either maximization or minimization).

The class provides support for the (incremental) solution of the MIP problem based on variations of the revised simplex method and on branch-and-bound techniques. The result of the resolution process is expressed in terms of an enumeration, encoding the feasibility and the unboundedness of the optimization problem. The class supports simple feasibility tests (i.e., no optimization), as well as the extraction of an optimal (resp., feasible) point, provided the MIP_Problem is optimizable (resp., feasible).

By exploiting the incremental nature of the solver, it is possible to reuse part of the computational work already done when solving variants of a given MIP_Problem: currently, incremental resolution supports the addition of space dimensions, the addition of constraints, the change of objective function and the change of optimization mode.

## 10.56.2 Constructor & Destructor Documentation

### 10.56.2.1 parma_polyhedra_library.MIP_Problem.MIP_Problem ( long *dim* ) [inline]

Builds a trivial MIP problem.

A trivial MIP problem requires to maximize the objective function 0 on a vector space under no constraints at all: the origin of the vector space is an optimal solution.

#### Parameters

| | |
|---|---|
| *dim* | The dimension of the vector space enclosing `this`. |

#### Exceptions

| | |
|---|---|
| *Length_Error_Exception* | Thrown if `dim` exceeds `max_space_dimension()`. |

#### 10.56.2.2 parma_polyhedra_library.MIP_Problem.MIP_Problem ( long *dim*, Constraint_System *cs*, Linear_Expression *obj*, Optimization_Mode *mode* ) [inline]

Builds an MIP problem having space dimension `dim` from the constraint system `cs`, the objective function `obj` and optimization mode `mode`.

#### Parameters

| | |
|---|---|
| *dim* | The dimension of the vector space enclosing `this`. |
| *cs* | The constraint system defining the feasible region. |
| *obj* | The objective function. |
| *mode* | The optimization mode. |

#### Exceptions

| | |
|---|---|
| *Length_Error_Exception* | Thrown if `dim` exceeds `max_space_dimension()`. |
| *Invalid_Argument_Exception* | Thrown if the constraint system contains any strict inequality or if the space dimension of the constraint system (resp., the objective function) is strictly greater than `dim`. |

### 10.56.3 Member Function Documentation

#### 10.56.3.1 native void parma_polyhedra_library.MIP_Problem.clear ( )

Resets `this` to be equal to the trivial MIP problem.

The space dimension is reset to 0.

#### 10.56.3.2 native void parma_polyhedra_library.MIP_Problem.add_space_dimensions_and_embed ( long *m* )

Adds `m` new space dimensions and embeds the old MIP problem in the new vector space.

#### Parameters

| | |
|---|---|
| *m* | The number of dimensions to add. |

#### Exceptions

| | |
|---|---|
| *Length_Error_Exception* | Thrown if adding `m` new space dimensions would cause the vector space to exceed dimension `max_space_dimension()`. |

The new space dimensions will be those having the highest indexes in the new MIP problem; they are initially unconstrained.

#### 10.56.3.3 native void parma_polyhedra_library.MIP_Problem.add_to_integer_space_dimensions ( Variables_Set *i_vars* )

Sets the variables whose indexes are in set `i_vars` to be integer space dimensions.

**Exceptions**

| | |
|---|---|
| *Invalid_Argument_Exception* | Thrown if some index in `i_vars` does not correspond to a space dimension in `this`. |

#### 10.56.3.4 native void parma_polyhedra_library.MIP_Problem.add_constraint ( Constraint *c* )

Adds a copy of constraint `c` to the MIP problem.

**Exceptions**

| | |
|---|---|
| *Invalid_Argument_Exception* | Thrown if the constraint `c` is a strict inequality or if its space dimension is strictly greater than the space dimension of `this`. |

#### 10.56.3.5 native void parma_polyhedra_library.MIP_Problem.add_constraints ( Constraint_System *cs* )

Adds a copy of the constraints in `cs` to the MIP problem.

**Exceptions**

| | |
|---|---|
| *Invalid_Argument_Exception* | Thrown if the constraint system `cs` contains any strict inequality or if its space dimension is strictly greater than the space dimension of `this`. |

#### 10.56.3.6 native void parma_polyhedra_library.MIP_Problem.set_objective_function ( Linear_Expression *obj* )

Sets the objective function to `obj`.

**Exceptions**

| | |
|---|---|
| *Invalid_Argument_Exception* | Thrown if the space dimension of `obj` is strictly greater than the space dimension of `this`. |

#### 10.56.3.7 native boolean parma_polyhedra_library.MIP_Problem.is_satisfiable ( )

Checks satisfiability of `this`.

**Returns**

`true` if and only if the MIP problem is satisfiable.

#### 10.56.3.8 native MIP_Problem_Status parma_polyhedra_library.MIP_Problem.solve ( )

Optimizes the MIP problem.

#### Returns

An MIP_Problem_Status flag indicating the outcome of the optimization attempt (unfeasible, unbounded or optimized problem).

#### 10.56.3.9 native void parma_polyhedra_library.MIP_Problem.evaluate_objective_function ( Generator *evaluating_point*, Coefficient *num*, Coefficient *den* )

Sets `num` and `den` so that $\frac{num}{den}$ is the result of evaluating the objective function on `evaluating_point`.

#### Parameters

| | |
|---|---|
| *evaluating_point* | The point on which the objective function will be evaluated. |
| *num* | On exit will contain the numerator of the evaluated value. |
| *den* | On exit will contain the denominator of the evaluated value. |

#### Exceptions

| | |
|---|---|
| *Invalid_Argument_Exception* | Thrown if `this` and `evaluating_point` are dimension-incompatible or if the generator `evaluating_point` is not a point. |

#### 10.56.3.10 native Generator parma_polyhedra_library.MIP_Problem.feasible_point ( )

Returns a feasible point for `this`, if it exists.

#### Exceptions

| | |
|---|---|
| *Domain_Error_Exception* | Thrown if the MIP problem is not satisfiable. |

#### 10.56.3.11 native Generator parma_polyhedra_library.MIP_Problem.optimizing_point ( )

Returns an optimal point for `this`, if it exists.

#### Exceptions

| | |
|---|---|
| *Domain_Error_Exception* | Thrown if `this` doesn't not have an optimizing point, i.e., if the MIP problem is unbounded or not satisfiable. |

#### 10.56.3.12 native void parma_polyhedra_library.MIP_Problem.optimal_value ( Coefficient *num*, Coefficient *den* )

Sets `num` and `den` so that $\frac{num}{den}$ is the solution of the optimization problem.

#### Exceptions

| | |
|---|---|
| *Domain_Error_Exception* | Thrown if `this` doesn't not have an optimizing point, i.e., if the MIP problem is unbounded or not satisfiable. |

The documentation for this class was generated from the following file:

- MIP_Problem.java

## 10.57 parma_polyhedra_library.MIP_Problem_Status Enum Reference

Possible outcomes of the MIP_Problem solver.

### Static Public Member Functions

- **[static initializer]**

### Public Attributes

- UNFEASIBLE_MIP_PROBLEM
  *The problem is unfeasible.*
- UNBOUNDED_MIP_PROBLEM
  *The problem is unbounded.*

### 10.57.1 Detailed Description

Possible outcomes of the MIP_Problem solver.

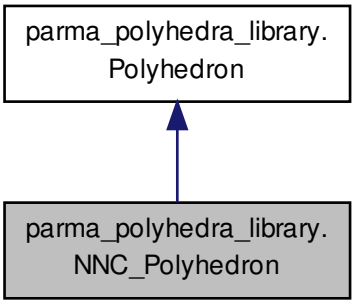
The documentation for this enum was generated from the following file:

- MIP_Problem_Status.java

## 10.58 parma_polyhedra_library.NNC_Polyhedron Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::NNC_Polyhedron.

Inheritance diagram for parma_polyhedra_library.NNC_Polyhedron:




### Public Member Functions

- **NNC_Polyhedron** (long num_dimensions, Degenerate_Element kind)
- **NNC_Polyhedron** (Int8_Box y)

- **NNC_Polyhedron** (Int16_Box y)
- **NNC_Polyhedron** (Int32_Box y)
- **NNC_Polyhedron** (Int64_Box y)
- **NNC_Polyhedron** (Uint8_Box y)
- **NNC_Polyhedron** (Uint16_Box y)
- **NNC_Polyhedron** (Uint32_Box y)
- **NNC_Polyhedron** (Uint64_Box y)
- **NNC_Polyhedron** (Z_Box y)
- **NNC_Polyhedron** (Rational_Box y)
- **NNC_Polyhedron** (BD_Shape_int8_t y)
- **NNC_Polyhedron** (BD_Shape_int16_t y)
- **NNC_Polyhedron** (BD_Shape_int32_t y)
- **NNC_Polyhedron** (BD_Shape_int64_t y)
- **NNC_Polyhedron** (BD_Shape_mpz_class y)
- **NNC_Polyhedron** (BD_Shape_mpq_class y)
- **NNC_Polyhedron** (Octagonal_Shape_int8_t y)
- **NNC_Polyhedron** (Octagonal_Shape_int16_t y)
- **NNC_Polyhedron** (Octagonal_Shape_int32_t y)
- **NNC_Polyhedron** (Octagonal_Shape_int64_t y)
- **NNC_Polyhedron** (Octagonal_Shape_mpz_class y)
- **NNC_Polyhedron** (Octagonal_Shape_mpq_class y)
- **NNC_Polyhedron** (C_Polyhedron y)
- **NNC_Polyhedron** (NNC_Polyhedron y)
- **NNC_Polyhedron** (Grid y)
- **NNC_Polyhedron** (Float_Box y)
- **NNC_Polyhedron** (BD_Shape_float y)
- **NNC_Polyhedron** (Octagonal_Shape_float y)
- **NNC_Polyhedron** (Double_Box y)
- **NNC_Polyhedron** (BD_Shape_double y)
- **NNC_Polyhedron** (Octagonal_Shape_double y)
- **NNC_Polyhedron** (Long_Double_Box y)
- **NNC_Polyhedron** (BD_Shape_long_double y)
- **NNC_Polyhedron** (Octagonal_Shape_long_double y)
- **NNC_Polyhedron** (Int8_Box y, Complexity_Class complexity)
- **NNC_Polyhedron** (Int16_Box y, Complexity_Class complexity)
- **NNC_Polyhedron** (Int32_Box y, Complexity_Class complexity)
- **NNC_Polyhedron** (Int64_Box y, Complexity_Class complexity)
- **NNC_Polyhedron** (Uint8_Box y, Complexity_Class complexity)
- **NNC_Polyhedron** (Uint16_Box y, Complexity_Class complexity)
- **NNC_Polyhedron** (Uint32_Box y, Complexity_Class complexity)
- **NNC_Polyhedron** (Uint64_Box y, Complexity_Class complexity)
- **NNC_Polyhedron** (Z_Box y, Complexity_Class complexity)
- **NNC_Polyhedron** (Rational_Box y, Complexity_Class complexity)
- **NNC_Polyhedron** (BD_Shape_int8_t y, Complexity_Class complexity)
- **NNC_Polyhedron** (BD_Shape_int16_t y, Complexity_Class complexity)
- **NNC_Polyhedron** (BD_Shape_int32_t y, Complexity_Class complexity)
- **NNC_Polyhedron** (BD_Shape_int64_t y, Complexity_Class complexity)
- **NNC_Polyhedron** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **NNC_Polyhedron** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **NNC_Polyhedron** (Octagonal_Shape_int8_t y, Complexity_Class complexity)

- **NNC_Polyhedron** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **NNC_Polyhedron** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **NNC_Polyhedron** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **NNC_Polyhedron** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **NNC_Polyhedron** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **NNC_Polyhedron** (C_Polyhedron y, Complexity_Class complexity)
- **NNC_Polyhedron** (NNC_Polyhedron y, Complexity_Class complexity)
- **NNC_Polyhedron** (Grid y, Complexity_Class complexity)
- **NNC_Polyhedron** (Float_Box y, Complexity_Class complexity)
- **NNC_Polyhedron** (BD_Shape_float y, Complexity_Class complexity)
- **NNC_Polyhedron** (Octagonal_Shape_float y, Complexity_Class complexity)
- **NNC_Polyhedron** (Double_Box y, Complexity_Class complexity)
- **NNC_Polyhedron** (BD_Shape_double y, Complexity_Class complexity)
- **NNC_Polyhedron** (Octagonal_Shape_double y, Complexity_Class complexity)
- **NNC_Polyhedron** (Long_Double_Box y, Complexity_Class complexity)
- **NNC_Polyhedron** (BD_Shape_long_double y, Complexity_Class complexity)
- **NNC_Polyhedron** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **NNC_Polyhedron** (Constraint_System cs)
- **NNC_Polyhedron** (Congruence_System cs)
- **NNC_Polyhedron** (Generator_System cs)
- native boolean **upper_bound_assign_if_exact** (NNC_Polyhedron y)
- native boolean **poly_hull_assign_if_exact** (NNC_Polyhedron y)
- native void **free** ()

#### Static Public Member Functions

- static native Pair
  < NNC_Polyhedron,
  Pointset_Powerset_NNC_Polyhedron > **linear_partition** (NNC_Polyhedron p, NNC_Polyhedron q)

#### Protected Member Functions

- native void **finalize** ()

### 10.58.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::NNC_Polyhedron.

The documentation for this class was generated from the following file:

- NNC_Polyhedron.java

## 10.59 parma_polyhedra_library.Octagonal_Shape_double Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<double>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Octagonal_Shape_double** (long num_dimensions, Degenerate_Element kind)
- **Octagonal_Shape_double** (Int8_Box y)
- **Octagonal_Shape_double** (Int16_Box y)
- **Octagonal_Shape_double** (Int32_Box y)
- **Octagonal_Shape_double** (Int64_Box y)
- **Octagonal_Shape_double** (Uint8_Box y)
- **Octagonal_Shape_double** (Uint16_Box y)
- **Octagonal_Shape_double** (Uint32_Box y)
- **Octagonal_Shape_double** (Uint64_Box y)
- **Octagonal_Shape_double** (Z_Box y)
- **Octagonal_Shape_double** (Rational_Box y)
- **Octagonal_Shape_double** (BD_Shape_int8_t y)
- **Octagonal_Shape_double** (BD_Shape_int16_t y)
- **Octagonal_Shape_double** (BD_Shape_int32_t y)
- **Octagonal_Shape_double** (BD_Shape_int64_t y)
- **Octagonal_Shape_double** (BD_Shape_mpz_class y)
- **Octagonal_Shape_double** (BD_Shape_mpq_class y)
- **Octagonal_Shape_double** (Octagonal_Shape_int8_t y)
- **Octagonal_Shape_double** (Octagonal_Shape_int16_t y)
- **Octagonal_Shape_double** (Octagonal_Shape_int32_t y)
- **Octagonal_Shape_double** (Octagonal_Shape_int64_t y)
- **Octagonal_Shape_double** (Octagonal_Shape_mpz_class y)
- **Octagonal_Shape_double** (Octagonal_Shape_mpq_class y)
- **Octagonal_Shape_double** (C_Polyhedron y)
- **Octagonal_Shape_double** (NNC_Polyhedron y)
- **Octagonal_Shape_double** (Grid y)
- **Octagonal_Shape_double** (Float_Box y)
- **Octagonal_Shape_double** (BD_Shape_float y)
- **Octagonal_Shape_double** (Octagonal_Shape_float y)
- **Octagonal_Shape_double** (Double_Box y)
- **Octagonal_Shape_double** (BD_Shape_double y)
- **Octagonal_Shape_double** (Octagonal_Shape_double y)
- **Octagonal_Shape_double** (Long_Double_Box y)
- **Octagonal_Shape_double** (BD_Shape_long_double y)
- **Octagonal_Shape_double** (Octagonal_Shape_long_double y)
- **Octagonal_Shape_double** (Int8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Int16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Int32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Int64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Uint8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Uint16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Uint32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Uint64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Z_Box y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Rational_Box y, Complexity_Class complexity)
- **Octagonal_Shape_double** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_double** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_double** (BD_Shape_int32_t y, Complexity_Class complexity)

- **Octagonal_Shape_double** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_double** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_double** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_double** (C_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_double** (NNC_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Grid y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Float_Box y, Complexity_Class complexity)
- **Octagonal_Shape_double** (BD_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_double** (BD_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Long_Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_double** (BD_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_double** (Constraint_System cs)
- **Octagonal_Shape_double** (Congruence_System cs)
- **Octagonal_Shape_double** (Generator_System cs)
- native void **swap** (Octagonal_Shape_double y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)

- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Octagonal_Shape_double y)
- native boolean **strictly_contains** (Octagonal_Shape_double y)
- native boolean **is_disjoint_from** (Octagonal_Shape_double y)
- native boolean **equals** (Octagonal_Shape_double p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Octagonal_Shape_double p)
- native void **upper_bound_assign** (Octagonal_Shape_double p)
- native void **difference_assign** (Octagonal_Shape_double p)
- native void **concatenate_assign** (Octagonal_Shape_double p)
- native void **time_elapse_assign** (Octagonal_Shape_double p)
- native boolean **upper_bound_assign_if_exact** (Octagonal_Shape_double y)
- native boolean **simplify_using_context_assign** (Octagonal_Shape_double p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)

- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (Octagonal_Shape_double y, By_Reference< Integer > tp)
- native void **widening_assign** (Octagonal_Shape_double y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (Octagonal_Shape_double y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Octagonal_Shape_double y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (Octagonal_Shape_double arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Octagonal_Shape_double arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair < Octagonal_Shape_double, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Octagonal_Shape_double p, Octagonal_Shape_double q)

#### Protected Member Functions

- native void **finalize** ()

### 10.59.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<double>

The documentation for this class was generated from the following file:

- Octagonal_Shape_double.java

## 10.60 parma_polyhedra_library.Octagonal_Shape_float Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<float>

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Octagonal_Shape_float** (long num_dimensions, Degenerate_Element kind)
- **Octagonal_Shape_float** (Int8_Box y)
- **Octagonal_Shape_float** (Int16_Box y)
- **Octagonal_Shape_float** (Int32_Box y)

- **Octagonal_Shape_float** (Int64_Box y)
- **Octagonal_Shape_float** (Uint8_Box y)
- **Octagonal_Shape_float** (Uint16_Box y)
- **Octagonal_Shape_float** (Uint32_Box y)
- **Octagonal_Shape_float** (Uint64_Box y)
- **Octagonal_Shape_float** (Z_Box y)
- **Octagonal_Shape_float** (Rational_Box y)
- **Octagonal_Shape_float** (BD_Shape_int8_t y)
- **Octagonal_Shape_float** (BD_Shape_int16_t y)
- **Octagonal_Shape_float** (BD_Shape_int32_t y)
- **Octagonal_Shape_float** (BD_Shape_int64_t y)
- **Octagonal_Shape_float** (BD_Shape_mpz_class y)
- **Octagonal_Shape_float** (BD_Shape_mpq_class y)
- **Octagonal_Shape_float** (Octagonal_Shape_int8_t y)
- **Octagonal_Shape_float** (Octagonal_Shape_int16_t y)
- **Octagonal_Shape_float** (Octagonal_Shape_int32_t y)
- **Octagonal_Shape_float** (Octagonal_Shape_int64_t y)
- **Octagonal_Shape_float** (Octagonal_Shape_mpz_class y)
- **Octagonal_Shape_float** (Octagonal_Shape_mpq_class y)
- **Octagonal_Shape_float** (C_Polyhedron y)
- **Octagonal_Shape_float** (NNC_Polyhedron y)
- **Octagonal_Shape_float** (Grid y)
- **Octagonal_Shape_float** (Float_Box y)
- **Octagonal_Shape_float** (BD_Shape_float y)
- **Octagonal_Shape_float** (Octagonal_Shape_float y)
- **Octagonal_Shape_float** (Double_Box y)
- **Octagonal_Shape_float** (BD_Shape_double y)
- **Octagonal_Shape_float** (Octagonal_Shape_double y)
- **Octagonal_Shape_float** (Long_Double_Box y)
- **Octagonal_Shape_float** (BD_Shape_long_double y)
- **Octagonal_Shape_float** (Octagonal_Shape_long_double y)
- **Octagonal_Shape_float** (Int8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Int16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Int32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Int64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Uint8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Uint16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Uint32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Uint64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Z_Box y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Rational_Box y, Complexity_Class complexity)
- **Octagonal_Shape_float** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_float** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_float** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Octagonal_Shape_float** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_float** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_float** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Octagonal_Shape_int32_t y, Complexity_Class complexity)

- **Octagonal_Shape_float** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_float** (C_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_float** (NNC_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Grid y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Float_Box y, Complexity_Class complexity)
- **Octagonal_Shape_float** (BD_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_float** (BD_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Long_Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_float** (BD_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_float** (Constraint_System cs)
- **Octagonal_Shape_float** (Congruence_System cs)
- **Octagonal_Shape_float** (Generator_System cs)
- native void **swap** (Octagonal_Shape_float y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Octagonal_Shape_float y)
- native boolean **strictly_contains** (Octagonal_Shape_float y)
- native boolean **is_disjoint_from** (Octagonal_Shape_float y)

- native boolean **equals** (Octagonal_Shape_float p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Octagonal_Shape_float p)
- native void **upper_bound_assign** (Octagonal_Shape_float p)
- native void **difference_assign** (Octagonal_Shape_float p)
- native void **concatenate_assign** (Octagonal_Shape_float p)
- native void **time_elapse_assign** (Octagonal_Shape_float p)
- native boolean **upper_bound_assign_if_exact** (Octagonal_Shape_float y)
- native boolean **simplify_using_context_assign** (Octagonal_Shape_float p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (Octagonal_Shape_float y, By_Reference< Integer > tp)
- native void **widening_assign** (Octagonal_Shape_float y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (Octagonal_Shape_float y, Constraint_System cs, By_Reference< Integer > tp)

- native void **limited_CC76_extrapolation_assign** (Octagonal_Shape_float y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (Octagonal_Shape_float arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Octagonal_Shape_float arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair < Octagonal_Shape_float, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Octagonal_Shape_float p, Octagonal_Shape_float q)

#### Protected Member Functions

- native void **finalize** ()

### 10.60.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<float>

The documentation for this class was generated from the following file:

- Octagonal_Shape_float.java

## 10.61 parma_polyhedra_library.Octagonal_Shape_int16_t Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<int16_t>

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Octagonal_Shape_int16_t** (long num_dimensions, Degenerate_Element kind)
- **Octagonal_Shape_int16_t** (Int8_Box y)
- **Octagonal_Shape_int16_t** (Int16_Box y)
- **Octagonal_Shape_int16_t** (Int32_Box y)
- **Octagonal_Shape_int16_t** (Int64_Box y)
- **Octagonal_Shape_int16_t** (Uint8_Box y)
- **Octagonal_Shape_int16_t** (Uint16_Box y)
- **Octagonal_Shape_int16_t** (Uint32_Box y)
- **Octagonal_Shape_int16_t** (Uint64_Box y)
- **Octagonal_Shape_int16_t** (Z_Box y)
- **Octagonal_Shape_int16_t** (Rational_Box y)
- **Octagonal_Shape_int16_t** (BD_Shape_int8_t y)

- **Octagonal_Shape_int16_t** (BD_Shape_int16_t y)
- **Octagonal_Shape_int16_t** (BD_Shape_int32_t y)
- **Octagonal_Shape_int16_t** (BD_Shape_int64_t y)
- **Octagonal_Shape_int16_t** (BD_Shape_mpz_class y)
- **Octagonal_Shape_int16_t** (BD_Shape_mpq_class y)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_int8_t y)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_int16_t y)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_int32_t y)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_int64_t y)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_mpz_class y)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_mpq_class y)
- **Octagonal_Shape_int16_t** (C_Polyhedron y)
- **Octagonal_Shape_int16_t** (NNC_Polyhedron y)
- **Octagonal_Shape_int16_t** (Grid y)
- **Octagonal_Shape_int16_t** (Float_Box y)
- **Octagonal_Shape_int16_t** (BD_Shape_float y)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_float y)
- **Octagonal_Shape_int16_t** (Double_Box y)
- **Octagonal_Shape_int16_t** (BD_Shape_double y)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_double y)
- **Octagonal_Shape_int16_t** (Long_Double_Box y)
- **Octagonal_Shape_int16_t** (BD_Shape_long_double y)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_long_double y)
- **Octagonal_Shape_int16_t** (Int8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Int16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Int32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Int64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Uint8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Uint16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Uint32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Uint64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Z_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Rational_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (C_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (NNC_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Grid y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Float_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (BD_Shape_float y, Complexity_Class complexity)

- **Octagonal_Shape_int16_t** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (BD_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Long_Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (BD_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_int16_t** (Constraint_System cs)
- **Octagonal_Shape_int16_t** (Congruence_System cs)
- **Octagonal_Shape_int16_t** (Generator_System cs)
- native void **swap** (Octagonal_Shape_int16_t y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Octagonal_Shape_int16_t y)
- native boolean **strictly_contains** (Octagonal_Shape_int16_t y)
- native boolean **is_disjoint_from** (Octagonal_Shape_int16_t y)
- native boolean **equals** (Octagonal_Shape_int16_t p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)

- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Octagonal_Shape_int16_t p)
- native void **upper_bound_assign** (Octagonal_Shape_int16_t p)
- native void **difference_assign** (Octagonal_Shape_int16_t p)
- native void **concatenate_assign** (Octagonal_Shape_int16_t p)
- native void **time_elapse_assign** (Octagonal_Shape_int16_t p)
- native boolean **upper_bound_assign_if_exact** (Octagonal_Shape_int16_t y)
- native boolean **simplify_using_context_assign** (Octagonal_Shape_int16_t p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (Octagonal_Shape_int16_t y, By_Reference< Integer > tp)
- native void **widening_assign** (Octagonal_Shape_int16_t y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (Octagonal_Shape_int16_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Octagonal_Shape_int16_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (Octagonal_Shape_int16_t arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Octagonal_Shape_int16_t arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_-Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity-_threshold, boolean wrap_individually)

- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair < Octagonal_Shape_int16_t, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Octagonal_Shape_int16_t p, Octagonal_Shape_int16_t q)

#### Protected Member Functions

- native void **finalize** ()

### 10.61.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<int16_t>

The documentation for this class was generated from the following file:

- Octagonal_Shape_int16_t.java

## 10.62 parma_polyhedra_library.Octagonal_Shape_int32_t Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<int32_t>

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Octagonal_Shape_int32_t** (long num_dimensions, Degenerate_Element kind)
- **Octagonal_Shape_int32_t** (Int8_Box y)
- **Octagonal_Shape_int32_t** (Int16_Box y)
- **Octagonal_Shape_int32_t** (Int32_Box y)
- **Octagonal_Shape_int32_t** (Int64_Box y)
- **Octagonal_Shape_int32_t** (Uint8_Box y)
- **Octagonal_Shape_int32_t** (Uint16_Box y)
- **Octagonal_Shape_int32_t** (Uint32_Box y)
- **Octagonal_Shape_int32_t** (Uint64_Box y)
- **Octagonal_Shape_int32_t** (Z_Box y)
- **Octagonal_Shape_int32_t** (Rational_Box y)
- **Octagonal_Shape_int32_t** (BD_Shape_int8_t y)
- **Octagonal_Shape_int32_t** (BD_Shape_int16_t y)
- **Octagonal_Shape_int32_t** (BD_Shape_int32_t y)
- **Octagonal_Shape_int32_t** (BD_Shape_int64_t y)
- **Octagonal_Shape_int32_t** (BD_Shape_mpz_class y)
- **Octagonal_Shape_int32_t** (BD_Shape_mpq_class y)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_int8_t y)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_int16_t y)

- **Octagonal_Shape_int32_t** (Octagonal_Shape_int32_t y)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_int64_t y)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_mpz_class y)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_mpq_class y)
- **Octagonal_Shape_int32_t** (C_Polyhedron y)
- **Octagonal_Shape_int32_t** (NNC_Polyhedron y)
- **Octagonal_Shape_int32_t** (Grid y)
- **Octagonal_Shape_int32_t** (Float_Box y)
- **Octagonal_Shape_int32_t** (BD_Shape_float y)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_float y)
- **Octagonal_Shape_int32_t** (Double_Box y)
- **Octagonal_Shape_int32_t** (BD_Shape_double y)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_double y)
- **Octagonal_Shape_int32_t** (Long_Double_Box y)
- **Octagonal_Shape_int32_t** (BD_Shape_long_double y)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_long_double y)
- **Octagonal_Shape_int32_t** (Int8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Int16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Int32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Int64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Uint8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Uint16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Uint32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Uint64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Z_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Rational_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (C_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (NNC_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Grid y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Float_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (BD_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (BD_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Long_Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (BD_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_int32_t** (Octagonal_Shape_long_double y, Complexity_Class complexity)

- **Octagonal_Shape_int32_t** (Constraint_System cs)
- **Octagonal_Shape_int32_t** (Congruence_System cs)
- **Octagonal_Shape_int32_t** (Generator_System cs)
- native void **swap** (Octagonal_Shape_int32_t y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Octagonal_Shape_int32_t y)
- native boolean **strictly_contains** (Octagonal_Shape_int32_t y)
- native boolean **is_disjoint_from** (Octagonal_Shape_int32_t y)
- native boolean **equals** (Octagonal_Shape_int32_t p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Octagonal_Shape_int32_t p)
- native void **upper_bound_assign** (Octagonal_Shape_int32_t p)
- native void **difference_assign** (Octagonal_Shape_int32_t p)
- native void **concatenate_assign** (Octagonal_Shape_int32_t p)

- native void **time_elapse_assign** (Octagonal_Shape_int32_t p)
- native boolean **upper_bound_assign_if_exact** (Octagonal_Shape_int32_t y)
- native boolean **simplify_using_context_assign** (Octagonal_Shape_int32_t p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (Octagonal_Shape_int32_t y, By_Reference< Integer > tp)
- native void **widening_assign** (Octagonal_Shape_int32_t y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (Octagonal_Shape_int32_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Octagonal_Shape_int32_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (Octagonal_Shape_int32_t arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Octagonal_Shape_int32_t arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_-Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity-_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Static Public Member Functions

- static native Pair
  < Octagonal_Shape_int32_t,
  Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Octagonal_Shape_int32_t p, Octagonal_Shape_int32_t q)

### Protected Member Functions

- native void **finalize** ()

### 10.62.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<int32_t>

The documentation for this class was generated from the following file:

- Octagonal_Shape_int32_t.java

## 10.63 parma_polyhedra_library.Octagonal_Shape_int64_t Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<int64_t>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Octagonal_Shape_int64_t** (long num_dimensions, Degenerate_Element kind)
- **Octagonal_Shape_int64_t** (Int8_Box y)
- **Octagonal_Shape_int64_t** (Int16_Box y)
- **Octagonal_Shape_int64_t** (Int32_Box y)
- **Octagonal_Shape_int64_t** (Int64_Box y)
- **Octagonal_Shape_int64_t** (Uint8_Box y)
- **Octagonal_Shape_int64_t** (Uint16_Box y)
- **Octagonal_Shape_int64_t** (Uint32_Box y)
- **Octagonal_Shape_int64_t** (Uint64_Box y)
- **Octagonal_Shape_int64_t** (Z_Box y)
- **Octagonal_Shape_int64_t** (Rational_Box y)
- **Octagonal_Shape_int64_t** (BD_Shape_int8_t y)
- **Octagonal_Shape_int64_t** (BD_Shape_int16_t y)
- **Octagonal_Shape_int64_t** (BD_Shape_int32_t y)
- **Octagonal_Shape_int64_t** (BD_Shape_int64_t y)
- **Octagonal_Shape_int64_t** (BD_Shape_mpz_class y)
- **Octagonal_Shape_int64_t** (BD_Shape_mpq_class y)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_int8_t y)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_int16_t y)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_int32_t y)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_int64_t y)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_mpz_class y)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_mpq_class y)

- **Octagonal_Shape_int64_t** (C_Polyhedron y)
- **Octagonal_Shape_int64_t** (NNC_Polyhedron y)
- **Octagonal_Shape_int64_t** (Grid y)
- **Octagonal_Shape_int64_t** (Float_Box y)
- **Octagonal_Shape_int64_t** (BD_Shape_float y)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_float y)
- **Octagonal_Shape_int64_t** (Double_Box y)
- **Octagonal_Shape_int64_t** (BD_Shape_double y)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_double y)
- **Octagonal_Shape_int64_t** (Long_Double_Box y)
- **Octagonal_Shape_int64_t** (BD_Shape_long_double y)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_long_double y)
- **Octagonal_Shape_int64_t** (Int8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Int16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Int32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Int64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Uint8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Uint16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Uint32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Uint64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Z_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Rational_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (C_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (NNC_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Grid y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Float_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (BD_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (BD_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Long_Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (BD_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_int64_t** (Constraint_System cs)
- **Octagonal_Shape_int64_t** (Congruence_System cs)
- **Octagonal_Shape_int64_t** (Generator_System cs)
- native void **swap** (Octagonal_Shape_int64_t y)

- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Octagonal_Shape_int64_t y)
- native boolean **strictly_contains** (Octagonal_Shape_int64_t y)
- native boolean **is_disjoint_from** (Octagonal_Shape_int64_t y)
- native boolean **equals** (Octagonal_Shape_int64_t p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Octagonal_Shape_int64_t p)
- native void **upper_bound_assign** (Octagonal_Shape_int64_t p)
- native void **difference_assign** (Octagonal_Shape_int64_t p)
- native void **concatenate_assign** (Octagonal_Shape_int64_t p)
- native void **time_elapse_assign** (Octagonal_Shape_int64_t p)
- native boolean **upper_bound_assign_if_exact** (Octagonal_Shape_int64_t y)
- native boolean **simplify_using_context_assign** (Octagonal_Shape_int64_t p)
- native boolean **constrains** (Variable var)

- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (Octagonal_Shape_int64_t y, By_Reference< Integer > tp)
- native void **widening_assign** (Octagonal_Shape_int64_t y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (Octagonal_Shape_int64_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Octagonal_Shape_int64_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (Octagonal_Shape_int64_t arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Octagonal_Shape_int64_t arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_-Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity-_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Static Public Member Functions

- static native Pair
< Octagonal_Shape_int64_t,
Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Octagonal_Shape_int64_t p, Octagonal-_Shape_int64_t q)

### Protected Member Functions

- native void **finalize** ()

### 10.63.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<int64_t>

The documentation for this class was generated from the following file:

- Octagonal_Shape_int64_t.java

## 10.64 parma_polyhedra_library.Octagonal_Shape_int8_t Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<int8_t>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Octagonal_Shape_int8_t** (long num_dimensions, Degenerate_Element kind)
- **Octagonal_Shape_int8_t** (Int8_Box y)
- **Octagonal_Shape_int8_t** (Int16_Box y)
- **Octagonal_Shape_int8_t** (Int32_Box y)
- **Octagonal_Shape_int8_t** (Int64_Box y)
- **Octagonal_Shape_int8_t** (Uint8_Box y)
- **Octagonal_Shape_int8_t** (Uint16_Box y)
- **Octagonal_Shape_int8_t** (Uint32_Box y)
- **Octagonal_Shape_int8_t** (Uint64_Box y)
- **Octagonal_Shape_int8_t** (Z_Box y)
- **Octagonal_Shape_int8_t** (Rational_Box y)
- **Octagonal_Shape_int8_t** (BD_Shape_int8_t y)
- **Octagonal_Shape_int8_t** (BD_Shape_int16_t y)
- **Octagonal_Shape_int8_t** (BD_Shape_int32_t y)
- **Octagonal_Shape_int8_t** (BD_Shape_int64_t y)
- **Octagonal_Shape_int8_t** (BD_Shape_mpz_class y)
- **Octagonal_Shape_int8_t** (BD_Shape_mpq_class y)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_int8_t y)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_int16_t y)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_int32_t y)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_int64_t y)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_mpz_class y)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_mpq_class y)
- **Octagonal_Shape_int8_t** (C_Polyhedron y)
- **Octagonal_Shape_int8_t** (NNC_Polyhedron y)
- **Octagonal_Shape_int8_t** (Grid y)
- **Octagonal_Shape_int8_t** (Float_Box y)
- **Octagonal_Shape_int8_t** (BD_Shape_float y)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_float y)
- **Octagonal_Shape_int8_t** (Double_Box y)

- **Octagonal_Shape_int8_t** (BD_Shape_double y)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_double y)
- **Octagonal_Shape_int8_t** (Long_Double_Box y)
- **Octagonal_Shape_int8_t** (BD_Shape_long_double y)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_long_double y)
- **Octagonal_Shape_int8_t** (Int8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Int16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Int32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Int64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Uint8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Uint16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Uint32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Uint64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Z_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Rational_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (C_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (NNC_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Grid y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Float_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (BD_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (BD_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Long_Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (BD_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_int8_t** (Constraint_System cs)
- **Octagonal_Shape_int8_t** (Congruence_System cs)
- **Octagonal_Shape_int8_t** (Generator_System cs)
- native void **swap** (Octagonal_Shape_int8_t y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()

- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Octagonal_Shape_int8_t y)
- native boolean **strictly_contains** (Octagonal_Shape_int8_t y)
- native boolean **is_disjoint_from** (Octagonal_Shape_int8_t y)
- native boolean **equals** (Octagonal_Shape_int8_t p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Octagonal_Shape_int8_t p)
- native void **upper_bound_assign** (Octagonal_Shape_int8_t p)
- native void **difference_assign** (Octagonal_Shape_int8_t p)
- native void **concatenate_assign** (Octagonal_Shape_int8_t p)
- native void **time_elapse_assign** (Octagonal_Shape_int8_t p)
- native boolean **upper_bound_assign_if_exact** (Octagonal_Shape_int8_t y)
- native boolean **simplify_using_context_assign** (Octagonal_Shape_int8_t p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)

- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (Octagonal_Shape_int8_t y, By_Reference< Integer > tp)
- native void **widening_assign** (Octagonal_Shape_int8_t y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (Octagonal_Shape_int8_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Octagonal_Shape_int8_t y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (Octagonal_Shape_int8_t arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Octagonal_Shape_int8_t arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Static Public Member Functions

- static native Pair < Octagonal_Shape_int8_t, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Octagonal_Shape_int8_t p, Octagonal_Shape_int8_t q)

### Protected Member Functions

- native void **finalize** ()

### 10.64.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<int8_t>

The documentation for this class was generated from the following file:

- Octagonal_Shape_int8_t.java

## 10.65 parma_polyhedra_library.Octagonal_Shape_long_double Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<long double>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Octagonal_Shape_long_double** (long num_dimensions, Degenerate_Element kind)
- **Octagonal_Shape_long_double** (Int8_Box y)
- **Octagonal_Shape_long_double** (Int16_Box y)
- **Octagonal_Shape_long_double** (Int32_Box y)
- **Octagonal_Shape_long_double** (Int64_Box y)
- **Octagonal_Shape_long_double** (Uint8_Box y)
- **Octagonal_Shape_long_double** (Uint16_Box y)
- **Octagonal_Shape_long_double** (Uint32_Box y)
- **Octagonal_Shape_long_double** (Uint64_Box y)
- **Octagonal_Shape_long_double** (Z_Box y)
- **Octagonal_Shape_long_double** (Rational_Box y)
- **Octagonal_Shape_long_double** (BD_Shape_int8_t y)
- **Octagonal_Shape_long_double** (BD_Shape_int16_t y)
- **Octagonal_Shape_long_double** (BD_Shape_int32_t y)
- **Octagonal_Shape_long_double** (BD_Shape_int64_t y)
- **Octagonal_Shape_long_double** (BD_Shape_mpz_class y)
- **Octagonal_Shape_long_double** (BD_Shape_mpq_class y)
- **Octagonal_Shape_long_double** (Octagonal_Shape_int8_t y)
- **Octagonal_Shape_long_double** (Octagonal_Shape_int16_t y)
- **Octagonal_Shape_long_double** (Octagonal_Shape_int32_t y)
- **Octagonal_Shape_long_double** (Octagonal_Shape_int64_t y)
- **Octagonal_Shape_long_double** (Octagonal_Shape_mpz_class y)
- **Octagonal_Shape_long_double** (Octagonal_Shape_mpq_class y)
- **Octagonal_Shape_long_double** (C_Polyhedron y)
- **Octagonal_Shape_long_double** (NNC_Polyhedron y)
- **Octagonal_Shape_long_double** (Grid y)
- **Octagonal_Shape_long_double** (Float_Box y)
- **Octagonal_Shape_long_double** (BD_Shape_float y)
- **Octagonal_Shape_long_double** (Octagonal_Shape_float y)
- **Octagonal_Shape_long_double** (Double_Box y)
- **Octagonal_Shape_long_double** (BD_Shape_double y)
- **Octagonal_Shape_long_double** (Octagonal_Shape_double y)
- **Octagonal_Shape_long_double** (Long_Double_Box y)
- **Octagonal_Shape_long_double** (BD_Shape_long_double y)
- **Octagonal_Shape_long_double** (Octagonal_Shape_long_double y)

- **Octagonal_Shape_long_double** (Int8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Int16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Int32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Int64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Uint8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Uint16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Uint32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Uint64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Z_Box y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Rational_Box y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (C_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (NNC_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Grid y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Float_Box y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (BD_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (BD_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Long_Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (BD_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_long_double** (Constraint_System cs)
- **Octagonal_Shape_long_double** (Congruence_System cs)
- **Octagonal_Shape_long_double** (Generator_System cs)
- native void **swap** (Octagonal_Shape_long_double y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()

- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Octagonal_Shape_long_double y)
- native boolean **strictly_contains** (Octagonal_Shape_long_double y)
- native boolean **is_disjoint_from** (Octagonal_Shape_long_double y)
- native boolean **equals** (Octagonal_Shape_long_double p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Octagonal_Shape_long_double p)
- native void **upper_bound_assign** (Octagonal_Shape_long_double p)
- native void **difference_assign** (Octagonal_Shape_long_double p)
- native void **concatenate_assign** (Octagonal_Shape_long_double p)
- native void **time_elapse_assign** (Octagonal_Shape_long_double p)
- native boolean **upper_bound_assign_if_exact** (Octagonal_Shape_long_double y)
- native boolean **simplify_using_context_assign** (Octagonal_Shape_long_double p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)

- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (Octagonal_Shape_long_double y, By_Reference< Integer > tp)
- native void **widening_assign** (Octagonal_Shape_long_double y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (Octagonal_Shape_long_double y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Octagonal_Shape_long_double y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (Octagonal_Shape_long_double arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Octagonal_Shape_long_double arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair < Octagonal_Shape_long_double, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Octagonal_Shape_long_double p, Octagonal_Shape_long_double q)

#### Protected Member Functions

- native void **finalize** ()

### 10.65.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<long double>

The documentation for this class was generated from the following file:

- Octagonal_Shape_long_double.java

## 10.66 parma_polyhedra_library.Octagonal_Shape_mpq_class Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<mpq_class>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Octagonal_Shape_mpq_class** (long num_dimensions, Degenerate_Element kind)
- **Octagonal_Shape_mpq_class** (Int8_Box y)
- **Octagonal_Shape_mpq_class** (Int16_Box y)
- **Octagonal_Shape_mpq_class** (Int32_Box y)
- **Octagonal_Shape_mpq_class** (Int64_Box y)
- **Octagonal_Shape_mpq_class** (Uint8_Box y)
- **Octagonal_Shape_mpq_class** (Uint16_Box y)
- **Octagonal_Shape_mpq_class** (Uint32_Box y)
- **Octagonal_Shape_mpq_class** (Uint64_Box y)
- **Octagonal_Shape_mpq_class** (Z_Box y)
- **Octagonal_Shape_mpq_class** (Rational_Box y)
- **Octagonal_Shape_mpq_class** (BD_Shape_int8_t y)
- **Octagonal_Shape_mpq_class** (BD_Shape_int16_t y)
- **Octagonal_Shape_mpq_class** (BD_Shape_int32_t y)
- **Octagonal_Shape_mpq_class** (BD_Shape_int64_t y)
- **Octagonal_Shape_mpq_class** (BD_Shape_mpz_class y)
- **Octagonal_Shape_mpq_class** (BD_Shape_mpq_class y)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_int8_t y)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_int16_t y)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_int32_t y)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_int64_t y)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_mpz_class y)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_mpq_class y)
- **Octagonal_Shape_mpq_class** (C_Polyhedron y)
- **Octagonal_Shape_mpq_class** (NNC_Polyhedron y)
- **Octagonal_Shape_mpq_class** (Grid y)
- **Octagonal_Shape_mpq_class** (Float_Box y)
- **Octagonal_Shape_mpq_class** (BD_Shape_float y)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_float y)
- **Octagonal_Shape_mpq_class** (Double_Box y)
- **Octagonal_Shape_mpq_class** (BD_Shape_double y)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_double y)
- **Octagonal_Shape_mpq_class** (Long_Double_Box y)
- **Octagonal_Shape_mpq_class** (BD_Shape_long_double y)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_long_double y)
- **Octagonal_Shape_mpq_class** (Int8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Int16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Int32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Int64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Uint8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Uint16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Uint32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Uint64_Box y, Complexity_Class complexity)

- **Octagonal_Shape_mpq_class** (Z_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Rational_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (C_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (NNC_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Grid y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Float_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (BD_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (BD_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Long_Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (BD_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_mpq_class** (Constraint_System cs)
- **Octagonal_Shape_mpq_class** (Congruence_System cs)
- **Octagonal_Shape_mpq_class** (Generator_System cs)
- native void **swap** (Octagonal_Shape_mpq_class y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)

- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Octagonal_Shape_mpq_class y)
- native boolean **strictly_contains** (Octagonal_Shape_mpq_class y)
- native boolean **is_disjoint_from** (Octagonal_Shape_mpq_class y)
- native boolean **equals** (Octagonal_Shape_mpq_class p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Octagonal_Shape_mpq_class p)
- native void **upper_bound_assign** (Octagonal_Shape_mpq_class p)
- native void **difference_assign** (Octagonal_Shape_mpq_class p)
- native void **concatenate_assign** (Octagonal_Shape_mpq_class p)
- native void **time_elapse_assign** (Octagonal_Shape_mpq_class p)
- native boolean **upper_bound_assign_if_exact** (Octagonal_Shape_mpq_class y)
- native boolean **simplify_using_context_assign** (Octagonal_Shape_mpq_class p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)

- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (Octagonal_Shape_mpq_class y, By_Reference< Integer > tp)
- native void **widening_assign** (Octagonal_Shape_mpq_class y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (Octagonal_Shape_mpq_class y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Octagonal_Shape_mpq_class y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (Octagonal_Shape_mpq_class arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Octagonal_Shape_mpq_class arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair < Octagonal_Shape_mpq_class, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Octagonal_Shape_mpq_class p, Octagonal_Shape_mpq_class q)

#### Protected Member Functions

- native void **finalize** ()

### 10.66.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<mpq_class>

The documentation for this class was generated from the following file:

- Octagonal_Shape_mpq_class.java

## 10.67 parma_polyhedra_library.Octagonal_Shape_mpz_class Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<mpz_class>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Octagonal_Shape_mpz_class** (long num_dimensions, Degenerate_Element kind)
- **Octagonal_Shape_mpz_class** (Int8_Box y)
- **Octagonal_Shape_mpz_class** (Int16_Box y)
- **Octagonal_Shape_mpz_class** (Int32_Box y)
- **Octagonal_Shape_mpz_class** (Int64_Box y)
- **Octagonal_Shape_mpz_class** (Uint8_Box y)
- **Octagonal_Shape_mpz_class** (Uint16_Box y)
- **Octagonal_Shape_mpz_class** (Uint32_Box y)
- **Octagonal_Shape_mpz_class** (Uint64_Box y)
- **Octagonal_Shape_mpz_class** (Z_Box y)
- **Octagonal_Shape_mpz_class** (Rational_Box y)
- **Octagonal_Shape_mpz_class** (BD_Shape_int8_t y)
- **Octagonal_Shape_mpz_class** (BD_Shape_int16_t y)
- **Octagonal_Shape_mpz_class** (BD_Shape_int32_t y)
- **Octagonal_Shape_mpz_class** (BD_Shape_int64_t y)
- **Octagonal_Shape_mpz_class** (BD_Shape_mpz_class y)
- **Octagonal_Shape_mpz_class** (BD_Shape_mpq_class y)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_int8_t y)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_int16_t y)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_int32_t y)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_int64_t y)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_mpz_class y)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_mpq_class y)
- **Octagonal_Shape_mpz_class** (C_Polyhedron y)
- **Octagonal_Shape_mpz_class** (NNC_Polyhedron y)
- **Octagonal_Shape_mpz_class** (Grid y)
- **Octagonal_Shape_mpz_class** (Float_Box y)
- **Octagonal_Shape_mpz_class** (BD_Shape_float y)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_float y)
- **Octagonal_Shape_mpz_class** (Double_Box y)
- **Octagonal_Shape_mpz_class** (BD_Shape_double y)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_double y)
- **Octagonal_Shape_mpz_class** (Long_Double_Box y)
- **Octagonal_Shape_mpz_class** (BD_Shape_long_double y)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_long_double y)
- **Octagonal_Shape_mpz_class** (Int8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Int16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Int32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Int64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Uint8_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Uint16_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Uint32_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Uint64_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Z_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Rational_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (BD_Shape_int32_t y, Complexity_Class complexity)

- **Octagonal_Shape_mpz_class** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (C_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (NNC_Polyhedron y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Grid y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Float_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (BD_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (BD_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Long_Double_Box y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (BD_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Octagonal_Shape_mpz_class** (Constraint_System cs)
- **Octagonal_Shape_mpz_class** (Congruence_System cs)
- **Octagonal_Shape_mpz_class** (Generator_System cs)
- native void **swap** (Octagonal_Shape_mpz_class y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)

- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Octagonal_Shape_mpz_class y)
- native boolean **strictly_contains** (Octagonal_Shape_mpz_class y)
- native boolean **is_disjoint_from** (Octagonal_Shape_mpz_class y)
- native boolean **equals** (Octagonal_Shape_mpz_class p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Octagonal_Shape_mpz_class p)
- native void **upper_bound_assign** (Octagonal_Shape_mpz_class p)
- native void **difference_assign** (Octagonal_Shape_mpz_class p)
- native void **concatenate_assign** (Octagonal_Shape_mpz_class p)
- native void **time_elapse_assign** (Octagonal_Shape_mpz_class p)
- native boolean **upper_bound_assign_if_exact** (Octagonal_Shape_mpz_class y)
- native boolean **simplify_using_context_assign** (Octagonal_Shape_mpz_class p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)

- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHMZ05_widening_assign** (Octagonal_Shape_mpz_class y, By_Reference< Integer > tp)
- native void **widening_assign** (Octagonal_Shape_mpz_class y, By_Reference< Integer > tp)
- native void **limited_BHMZ05_extrapolation_assign** (Octagonal_Shape_mpz_class y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Octagonal_Shape_mpz_class y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_extrapolation_assign** (Octagonal_Shape_mpz_class arg, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Octagonal_Shape_mpz_class arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair < Octagonal_Shape_mpz_class, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Octagonal_Shape_mpz_class p, Octagonal_Shape_mpz_class q)

#### Protected Member Functions

- native void **finalize** ()

### 10.67.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Octagonal_Shape<mpz_class>

The documentation for this class was generated from the following file:

- Octagonal_Shape_mpz_class.java

## 10.68 parma_polyhedra_library.Optimization_Mode Enum Reference

Possible optimization modes.

#### Static Public Member Functions

- **[static initializer]**

#### Public Attributes

- MINIMIZATION
  *Minimization is requested.*

### 10.68.1 Detailed Description

Possible optimization modes.

The documentation for this enum was generated from the following file:

- Optimization_Mode.java

## 10.69 parma_polyhedra_library.Overflow_Error_Exception Class Reference

Exceptions due to overflow errors.

#### Public Member Functions

- Overflow_Error_Exception (String s)
  *Constructor.*

### 10.69.1 Detailed Description

Exceptions due to overflow errors.

These exceptions can be obtained when the library has been configured to use integer coefficients having bounded size.

The documentation for this class was generated from the following file:

- Overflow_Error_Exception.java

## 10.70 parma_polyhedra_library.Pair< K, V > Class Reference

A pair of values of type K and V.

#### Public Member Functions

- K getFirst ()
  *Returns the object of type K.*
- V getSecond ()
  *Returns the object of type V.*

### 10.70.1 Detailed Description

A pair of values of type K and V.

An object of this class holds an ordered pair of values of type K and V.

The documentation for this class was generated from the following file:

- Pair.java

## 10.71 parma_polyhedra_library.Parma_Polyhedra_Library Class Reference

A class collecting library-level functions.

### Static Public Member Functions

#### Library initialization and finalization

- static native void initialize_library ()
  *Initializes the Parma Polyhedra Library.*
- static native void finalize_library ()
  *Finalizes the Parma Polyhedra Library.*

#### Version Checking

- static native int version_major ()
  *Returns the major number of the PPL version.*
- static native int version_minor ()
  *Returns the minor number of the PPL version.*
- static native int version_revision ()
  *Returns the revision number of the PPL version.*
- static native int version_beta ()
  *Returns the beta number of the PPL version.*
- static native String version ()
  *Returns a string containing the PPL version.*
- static native String banner ()
  *Returns a string containing the PPL banner.*

#### Floating-point rounding and precision settings.

- static native void set_rounding_for_PPL ()
  *Sets the FPU rounding mode so that the PPL abstractions based on floating point numbers work correctly.*
- static native void restore_pre_PPL_rounding ()
  *Sets the FPU rounding mode as it was before initialization of the PPL.*
- static native int irrational_precision ()
  *Returns the precision parameter for irrational calculations.*
- static native void set_irrational_precision (int p)
  *Sets the precision parameter used for irrational calculations.*

#### Timeout handling

- static native void set_timeout (int csecs)
  *Sets the timeout for computations whose completion could require an exponential amount of time.*
- static native void reset_timeout ()
  *Resets the timeout time so that the computation is not interrupted.*
- static native void set_deterministic_timeout (int unscaled_weight, int scale)
  *Sets a threshold for computations whose completion could require an exponential amount of time.*
- static native void reset_deterministic_timeout ()
  *Resets the deterministic timeout so that the computation is not interrupted.*

### 10.71.1 Detailed Description

A class collecting library-level functions.

### 10.71.2 Member Function Documentation

#### 10.71.2.1 static native void parma_polyhedra_library.Parma_Polyhedra_Library.initialize_library ( ) [static]

Initializes the Parma Polyhedra Library.

This method must be called after loading the library and before calling any other method from any other PPL package class.

#### 10.71.2.2 static native void parma_polyhedra_library.Parma_Polyhedra_Library.finalize_library ( ) [static]

Finalizes the Parma Polyhedra Library.

This method must be called when work with the library is done. After finalization, no other library method can be called (except those in class Parma_Polyhedra_Library), unless the library is re-initialized by calling `initialize_library()`.

#### 10.71.2.3 static native String parma_polyhedra_library.Parma_Polyhedra_Library.banner ( ) [static]

Returns a string containing the PPL banner.

The banner provides information about the PPL version, the licensing, the lack of any warranty whatsoever, the C++ compiler used to build the library, where to report bugs and where to look for further information.

#### 10.71.2.4 static native void parma_polyhedra_library.Parma_Polyhedra_Library.set_rounding_for_PPL ( ) [static]

Sets the FPU rounding mode so that the PPL abstractions based on floating point numbers work correctly.

This is performed automatically at initialization-time. Calling this function is needed only if restore_pre_-PPL_rounding() has been previously called.

#### 10.71.2.5 static native void parma_polyhedra_library.Parma_Polyhedra_Library.restore_pre_PPL_rounding ( ) [static]

Sets the FPU rounding mode as it was before initialization of the PPL.

After calling this function it is absolutely necessary to call set_rounding_for_PPL() before using any PPL abstractions based on floating point numbers. This is performed automatically at finalization-time.

#### 10.71.2.6 static native void parma_polyhedra_library.Parma_Polyhedra_Library.set_irrational_precision ( int *p* ) [static]

Sets the precision parameter used for irrational calculations.

If `p` is less than or equal to `INT_MAX`, sets the precision parameter used for irrational calculations to `p`. Then, in the irrational calculations returning an unbounded rational, (e.g., when computing a square root), the lesser between numerator and denominator will be limited to `2**p`.

#### 10.71.2.7 static native void parma_polyhedra_library.Parma_Polyhedra_Library.set_timeout ( int *csecs* ) [static]

Sets the timeout for computations whose completion could require an exponential amount of time.

**Parameters**

| | |
|---|---|
| *csecs* | The number of centiseconds sometimes after which a timeout will occur; it must be strictly greater than zero. |

Computations taking exponential time will be interrupted some time after `csecs` centiseconds have elapsed since the call to the timeout setting function, by throwing a `Timeout_Exception` object. Otherwise, if the computation completes without being interrupted, then the timeout should be reset by calling `reset_timeout()`.

#### 10.71.2.8 static native void parma_polyhedra_library.Parma_Polyhedra_Library.set_deterministic_timeout ( int *unscaled_weight*, int *scale* ) [static]

Sets a threshold for computations whose completion could require an exponential amount of time.

If `unscaled_weight` has value $u$ and `scale` has value $s$, then the (scaled) weight threshold is computed as $w = u \cdot 2^s$. Computations taking exponential time will be interrupted some time after reaching the complexity threshold $w$, by throwing a `Timeout_Exception` object. Otherwise, if the computation completes without being interrupted, then the deterministic timeout should be reset by calling `reset_deterministic_timeout()`.

**Parameters**

| | |
|---|---|
| *unscaled_weight* | The unscaled maximum computational weight; it has to be strictly greater than zero. |
| *scale* | The scaling factor to be applied to `unscaled_weight`; it has to be non-negative. |

**Exceptions**

| | |
|---|---|
| *Invalid_Argument_Exception* | Thrown if the computation of the weight threshold exceeds the maximum allowed value. |

**Note**

This "timeout" checking functionality is said to be *deterministic* because it is not based on actual elapsed time. Its behavior will only depend on (some of the) computations performed in the PPL library and it will be otherwise independent from the computation environment (CPU, operating system, compiler, etc.).

**Warning**

The weight mechanism is under beta testing. In particular, there is still no clear relation between the weight threshold and the actual computational complexity. As a consequence, client applications should be ready to reconsider the tuning of these weight thresholds when upgrading to newer version of the PPL.

The documentation for this class was generated from the following file:

- Parma_Polyhedra_Library.java

## 10.72 parma_polyhedra_library.Partial_Function Class Reference

A partial function on space dimension indices.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- Partial_Function ()

  *Builds the empty map.*
- native void insert (long i, long j)

  *Inserts mapping from `i` to `j`.*
- native boolean has_empty_codomain ()

  *Returns `true` if and only if the partial function has an empty codomain (i.e., it is always undefined).*
- native long max_in_codomain ()

  *Returns the maximum value that belongs to the codomain of the partial function.*
- native long maps (long i)

  *If the partial function is defined on index `i`, returns its value.*
- native void free ()

  *Releases all resources managed by `this`, also resetting it to a null reference.*

### Protected Member Functions

- native void finalize ()

  *Releases all resources managed by `this`.*

### 10.72.1 Detailed Description

A partial function on space dimension indices.

This class is used in order to specify how space dimensions should be mapped by methods named `map_space_dimensions`.

### 10.72.2 Member Function Documentation

#### 10.72.2.1 native boolean parma_polyhedra_library.Partial_Function.has_empty_codomain ( )

Returns `true` if and only if the partial function has an empty codomain (i.e., it is always undefined).

This method will always be called before the other methods of the interface. Moreover, if `true` is returned, then none of the other interface methods will be called.

#### 10.72.2.2 native long parma_polyhedra_library.Partial_Function.maps ( long *i* )

If the partial function is defined on index `i`, returns its value.

The function returns a negative value if the partial function is not defined on domain value `i`.

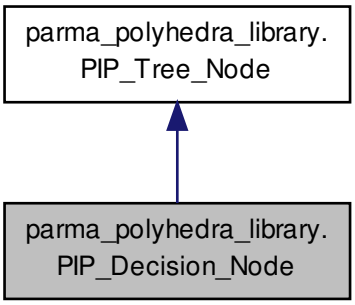
The documentation for this class was generated from the following file:

- Partial_Function.java

## 10.73 parma_polyhedra_library.PIP_Decision_Node Class Reference

An internal node of the PIP solution tree.

Inheritance diagram for parma_polyhedra_library.PIP_Decision_Node:




### Public Member Functions

- native PIP_Tree_Node child_node (boolean branch)

  *Returns the true branch (if `branch` is true) or the false branch (if `branch` is false) of `this`.*

### 10.73.1 Detailed Description

An internal node of the PIP solution tree.

The documentation for this class was generated from the following file:

- PIP_Decision_Node.java

## 10.74 parma_polyhedra_library.PIP_Problem Class Reference

A Parametric Integer Programming problem.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- PIP_Problem (long dim)

  *Builds a trivial PIP problem.*
- PIP_Problem (long dim, Constraint_System cs, Variables_Set params)

  *Builds a PIP problem from a sequence of constraints.*
- PIP_Problem (PIP_Problem y)

  *Builds a copy of `y`.*

- native void free ()

  *Releases all resources managed by `this`, also resetting it to a null reference.*

### Functions that Do Not Modify the PIP_Problem

- native long max_space_dimension ()

  *Returns the maximum space dimension an PIP_Problem can handle.*
- native long space_dimension ()

  *Returns the space dimension of the PIP problem.*
- native long number_of_parameter_space_dimensions ()

  *Returns the number of parameter space dimensions of the PIP problem.*
- native Variables_Set parameter_space_dimensions ()

  *Returns all the parameter space dimensions of problem `pip`.*
- native long get_big_parameter_dimension ()

  *Returns the big parameter dimension of PIP problem `pip`.*
- native long number_of_constraints ()

  *Returns the number of constraints defining the feasible region of `pip`.*
- native Constraint constraint_at_index (long dim)

  *Returns the `i-th` constraint defining the feasible region of the PIP problem `pip`.*
- native Constraint_System constraints ()

  *Returns the constraints .*
- native String ascii_dump ()

  *Returns an ascii formatted internal representation of `this`.*
- native String toString ()

  *Returns a string representation of `this`.*
- native long total_memory_in_bytes ()

  *Returns the size in bytes of the memory occupied by the underlying C++ object.*
- native long external_memory_in_bytes ()

  *Returns the size in bytes of the memory managed by the underlying C++ object.*
- native boolean OK ()

  *Returns true if the pip problem is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if broken. Useful for debugging purposes.*

### Functions that May Modify the PIP_Problem

- native void clear ()

  *Resets `this` to be equal to the trivial PIP problem.*
- native void add_space_dimensions_and_embed (long pip_vars, long pip_params)

  *Adds `pip_vars + pip_params` new space dimensions and embeds the PIP problem in the new vector space.*
- native void add_to_parameter_space_dimensions (Variables_Set vars)

  *Sets the space dimensions in `vars` to be parameter dimensions of the PIP problem.*
- native void set_big_parameter_dimension (long d)

  *Sets the big parameter dimension of PIP problem to `d`.*
- native void add_constraint (Constraint c)

  *Adds a copy of constraint `c` to the PIP problem.*
- native void add_constraints (Constraint_System cs)

  *Adds a copy of the constraints in `cs` to the PIP problem.*

### Computing the Solution of the PIP_Problem

- native boolean is_satisfiable ()

*Checks satisfiability of* `this`.

- native PIP_Problem_Status solve ()

  *Optimizes the PIP problem.*
- native PIP_Tree_Node solution ()

  *Returns a solution for the PIP problem, if it exists.*
- native PIP_Tree_Node optimizing_solution ()

  *Returns an optimizing solution for the PIP problem, if it exists.*

**Querying/Setting Control Parameters**

- native PIP_Problem_Control_Parameter_Value get_pip_problem_control_parameter (PIP_Problem_Control_Parameter_Name name)

  *Returns the value of control parameter* `name`.
- native void set_pip_problem_control_parameter (PIP_Problem_Control_Parameter_Value value)

  *Sets control parameter* `value`.

#### Protected Member Functions

- native void finalize ()

  *Releases all resources managed by* `this`.

### 10.74.1 Detailed Description

A Parametric Integer Programming problem.

An object of this class encodes a parametric integer (linear) programming problem. The PIP problem is specified by providing:

- the dimension of the vector space;
- the subset of those dimensions of the vector space that are interpreted as integer parameters (the other space dimensions are interpreted as non-parameter integer variables);
- a finite set of linear equality and (strict or non-strict) inequality constraints involving variables and/or parameters; these constraints are used to define:
  - the *feasible region*, if they involve one or more problem variable (and maybe some parameters);
  - the *initial context*, if they only involve the parameters;
- optionally, the so-called *big parameter*, i.e., a problem parameter to be considered arbitrarily big.

Note that all problem variables and problem parameters are assumed to take non-negative integer values, so that there is no need to specify non-negativity constraints.

The class provides support for the (incremental) solution of the PIP problem based on variations of the revised simplex method and on Gomory cut generation techniques.

The solution for a PIP problem is the lexicographic minimum of the integer points of the feasible region, expressed in terms of the parameters. As the problem to be solved only involves non-negative variables and parameters, the problem will always be either unfeasible or optimizable.

As the feasibility and the solution value of a PIP problem depend on the values of the parameters, the solution is a binary decision tree, dividing the context parameter set into subsets. The tree nodes are of two kinds:

- *Decision* nodes. These are internal tree nodes encoding one or more linear tests on the parameters; if all the tests are satisfied, then the solution is the node's *true* child; otherwise, the solution is the node's *false* child;
- *Solution* nodes. These are leaf nodes in the tree, encoding the solution of the problem in the current context subset, where each variable is defined in terms of a linear expression of the parameters. Solution nodes also optionally embed a set of parameter constraints: if all these constraints are satisfied, the solution is described by the node, otherwise the problem has no solution.

It may happen that a decision node has no *false* child. This means that there is no solution if at least one of the corresponding constraints is not satisfied. Decision nodes having two or more linear tests on the parameters cannot have a *false* child. Decision nodes always have a *true* child.

Both kinds of tree nodes may also contain the definition of extra parameters which are artificially introduced by the solver to enforce an integral solution. Such artificial parameters are defined by the integer division of a linear expression on the parameters by an integer coefficient.

By exploiting the incremental nature of the solver, it is possible to reuse part of the computational work already done when solving variants of a given PIP_Problem: currently, incremental resolution supports the addition of space dimensions, the addition of parameters and the addition of constraints.

### 10.74.2 Constructor & Destructor Documentation

#### 10.74.2.1 parma_polyhedra_library.PIP_Problem.PIP_Problem ( long *dim* ) [inline]

Builds a trivial PIP problem.

A trivial PIP problem requires to compute the lexicographic minimum on a vector space under no constraints and with no parameters: due to the implicit non-negativity constraints, the origin of the vector space is an optimal solution.

**Parameters**

| | |
|---|---|
| *dim* | The dimension of the vector space enclosing `this` (optional argument with default value 0). |

**Exceptions**

| | |
|---|---|
| *Length_Error_Exception* | Thrown if `dim` exceeds `max_space_dimension()`. |

#### 10.74.2.2 parma_polyhedra_library.PIP_Problem.PIP_Problem ( long *dim*, Constraint_System *cs*, Variables_Set *params* ) [inline]

Builds a PIP problem from a sequence of constraints.

Builds a PIP problem having space dimension `dim` from the constraint system cs; the dimensions `vars` are interpreted as parameters.

### 10.74.3 Member Function Documentation

#### 10.74.3.1 native void parma_polyhedra_library.PIP_Problem.clear ( )

Resets `this` to be equal to the trivial PIP problem.

The space dimension is reset to 0.

#### 10.74.3.2 native void parma_polyhedra_library.PIP_Problem.add_space_dimensions_and_embed ( long *pip_vars*, long *pip_params* )

Adds `pip_vars + pip_params` new space dimensions and embeds the PIP problem in the new vector space.

**Parameters**

| | |
|---|---|
| *pip_vars* | The number of space dimensions to add that are interpreted as PIP problem variables (i.e., non parameters). These are added before adding the `pip_params` parameters. |
| *pip_params* | The number of space dimensions to add that are interpreted as PIP problem parameters. These are added after having added the `pip_vars` problem variables. |

The new space dimensions will be those having the highest indexes in the new PIP problem; they are initially unconstrained.

#### 10.74.3.3 native void parma_polyhedra_library.PIP_Problem.add_constraint ( Constraint *c* )

Adds a copy of constraint `c` to the PIP problem.

**Exceptions**

| | |
|---|---|
| *Invalid_Argument_Exception* | Thrown if the constraint `c` is a strict inequality or if its space dimension is strictly greater than the space dimension of `this`. |

#### 10.74.3.4 native void parma_polyhedra_library.PIP_Problem.add_constraints ( Constraint_System *cs* )

Adds a copy of the constraints in `cs` to the PIP problem.

**Exceptions**

| | |
|---|---|
| *Invalid_Argument_Exception* | Thrown if the constraint system `cs` contains any strict inequality or if its space dimension is strictly greater than the space dimension of `this`. |

#### 10.74.3.5 native boolean parma_polyhedra_library.PIP_Problem.is_satisfiable ( )

Checks satisfiability of `this`.

**Returns**

`true` if and only if the PIP problem is satisfiable.

#### 10.74.3.6 native PIP_Problem_Status parma_polyhedra_library.PIP_Problem.solve ( )

Optimizes the PIP problem.

Solves the PIP problem, returning an exit status.

**Returns**

`UNFEASIBLE_PIP_PROBLEM` if the PIP problem is not satisfiable; `OPTIMIZED_PIP_PROBLEM` if the PIP problem admits an optimal solution.

The documentation for this class was generated from the following file:

- PIP_Problem.java

## 10.75 parma_polyhedra_library.PIP_Problem_Control_Parameter_Name Enum Reference

Names of PIP problems' control parameters.

### Public Attributes

- CUTTING_STRATEGY

  *The cutting strategy rule.*
- PIVOT_ROW_STRATEGY

  *The pivot row strategy rule.*

### 10.75.1 Detailed Description

Names of PIP problems' control parameters.

The documentation for this enum was generated from the following file:

- PIP_Problem_Control_Parameter_Name.java

## 10.76 parma_polyhedra_library.PIP_Problem_Control_Parameter_Value Enum Reference

Possible values for PIP problems' control parameters.

### Public Attributes

- CUTTING_STRATEGY_FIRST

  *Choose the first non-integer row.*
- CUTTING_STRATEGY_DEEPEST

  *Choose row which generates the deepest cut.*
- CUTTING_STRATEGY_ALL

  *Always generate all possible cuts.*
- PIVOT_ROW_STRATEGY_FIRST

  *Choose the first row with negative parameter sign.*
- PIVOT_ROW_STRATEGY_MAX_COLUMN

  *Choose the row which generates the lexico-maximal pivot column.*

### 10.76.1 Detailed Description

Possible values for PIP problems' control parameters.

The documentation for this enum was generated from the following file:

- PIP_Problem_Control_Parameter_Value.java

## 10.77 parma_polyhedra_library.PIP_Problem_Status Enum Reference

Possible outcomes of the PIP_Problem solver.

#### Static Public Member Functions

- **[static initializer]**

#### Public Attributes

- UNFEASIBLE_PIP_PROBLEM

  *The problem is unsatisfiable.*

### 10.77.1 Detailed Description

Possible outcomes of the PIP_Problem solver.

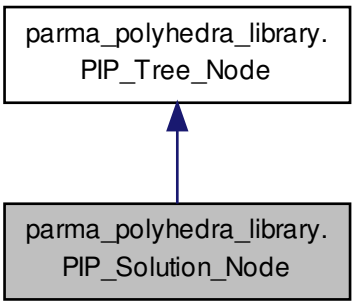
The documentation for this enum was generated from the following file:

- PIP_Problem_Status.java

## 10.78 parma_polyhedra_library.PIP_Solution_Node Class Reference

A leaf node of the PIP solution tree.

Inheritance diagram for parma_polyhedra_library.PIP_Solution_Node:




#### Public Member Functions

- native Linear_Expression parametric_values (Variable var)

  *Returns the parametric expression of the values of variable* `var` *in solution node* `this`.

### 10.78.1 Detailed Description

A leaf node of the PIP solution tree.

### 10.78.2 Member Function Documentation

#### 10.78.2.1 native Linear_Expression parma_polyhedra_library.PIP_Solution_Node.parametric_values ( Variable *var* )

Returns the parametric expression of the values of variable `var` in solution node `this`.

The returned parametric expression will only refer to (problem or artificial) parameters.

**Parameters**

| | |
|---|---|
| *var* | The variable being queried. |

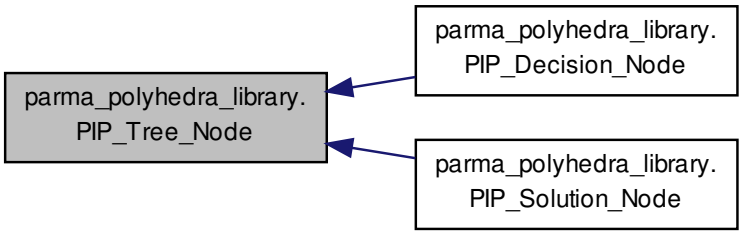
The documentation for this class was generated from the following file:

- PIP_Solution_Node.java

## 10.79 parma_polyhedra_library.PIP_Tree_Node Class Reference

A node of the PIP solution tree.

Inheritance diagram for parma_polyhedra_library.PIP_Tree_Node:




**Public Member Functions**

- native PIP_Solution_Node as_solution ()

  *Returns the solution node if `this` is a solution node, and 0 otherwise.*
- native PIP_Decision_Node as_decision ()

  *Returns the decision node if `this` is a decision node, and 0 otherwise.*
- native boolean OK ()

  *Returns true if the pip tree is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if broken. Useful for debugging purposes.*
- native long number_of_artificials ()

  *Returns the number of artificial parameters in the PIP_Tree_Node.*
- native Artificial_Parameter_Sequence artificials ()

  *Returns the sequence of (Java) artificial parameters in the PIP_Tree_Node.*

- native Constraint_System constraints ()

  *Returns the system of parameter constraints controlling the PIP_Tree_Node.*
- native String toString ()

  *Returns a string representation of* `this`.

#### Additional Inherited Members

### 10.79.1 Detailed Description

A node of the PIP solution tree.

This is the base class for the nodes of the binary trees representing the solutions of PIP problems. From this one, two classes are derived:

- PIP_Decision_Node, for the internal nodes of the tree;
- PIP_Solution_Node, for the leaves of the tree.

### 10.79.2 Member Function Documentation

#### 10.79.2.1 native Constraint_System parma_polyhedra_library.PIP_Tree_Node.constraints ( )

Returns the system of parameter constraints controlling the PIP_Tree_Node.

The indices in the constraints are the same as the original variables and parameters. Coefficients in indices corresponding to variables always are zero.

The documentation for this class was generated from the following file:

- PIP_Tree_Node.java

## 10.80 parma_polyhedra_library.Pointset_Powerset_BD_Shape_double Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<double> >

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_BD_Shape_double** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_BD_Shape_double** (Pointset_Powerset_BD_Shape_double y)
- **Pointset_Powerset_BD_Shape_double** (BD_Shape_double y)
- **Pointset_Powerset_BD_Shape_double** (Pointset_Powerset_BD_Shape_double y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_double** (BD_Shape_double y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_double** (Constraint_System cs)
- **Pointset_Powerset_BD_Shape_double** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_BD_Shape_double y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)

- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_BD_Shape_double y)
- native boolean **strictly_contains** (Pointset_Powerset_BD_Shape_double y)
- native boolean **is_disjoint_from** (Pointset_Powerset_BD_Shape_double y)
- native boolean **geometrically_covers** (Pointset_Powerset_BD_Shape_double y)
- native boolean **geometrically_equals** (Pointset_Powerset_BD_Shape_double y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_double p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_BD_Shape_double p)
- native void **upper_bound_assign** (Pointset_Powerset_BD_Shape_double p)
- native void **difference_assign** (Pointset_Powerset_BD_Shape_double p)
- native void **concatenate_assign** (Pointset_Powerset_BD_Shape_double p)
- native void **time_elapse_assign** (Pointset_Powerset_BD_Shape_double p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_BD_Shape_double y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_BD_Shape_double p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)

- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_BD_Shape_double_Iterator **begin_iterator** ()
- native Pointset_Powerset_BD_Shape_double_Iterator **end_iterator** ()
- native void **add_disjunct** (BD_Shape_double j_disj)
- native void **drop_disjunct** (Pointset_Powerset_BD_Shape_double_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_BD_Shape_double_Iterator itr1, Pointset_Powerset_BD_Shape_double_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_BD_Shape_double y)
- native void **BHZ03_H79_H79_widening_assign** (Pointset_Powerset_BD_Shape_double y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_BD_Shape_double y, Integer d)
- native void **BGP99_H79_extrapolation_assign** (Pointset_Powerset_BD_Shape_double y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.80.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<double> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_double.java

## 10.81 parma_polyhedra_library.Pointset_Powerset_BD_Shape_double_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<double> >:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_BD_Shape_double_Iterator** (Pointset_Powerset_BD_Shape_double_Iterator y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_double_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native BD_Shape_double **get_disjunct** ()
- native void **free** ()

### Protected Member Functions

- native void **finalize** ()

### 10.81.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<double> >:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_double_Iterator.java

## 10.82 parma_polyhedra_library.Pointset_Powerset_BD_Shape_float Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<float> >

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_BD_Shape_float** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_BD_Shape_float** (Pointset_Powerset_BD_Shape_float y)
- **Pointset_Powerset_BD_Shape_float** (BD_Shape_float y)
- **Pointset_Powerset_BD_Shape_float** (Pointset_Powerset_BD_Shape_float y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_float** (BD_Shape_float y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_float** (Constraint_System cs)
- **Pointset_Powerset_BD_Shape_float** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_BD_Shape_float y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)

- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_BD_Shape_float y)
- native boolean **strictly_contains** (Pointset_Powerset_BD_Shape_float y)
- native boolean **is_disjoint_from** (Pointset_Powerset_BD_Shape_float y)
- native boolean **geometrically_covers** (Pointset_Powerset_BD_Shape_float y)
- native boolean **geometrically_equals** (Pointset_Powerset_BD_Shape_float y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_float p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_BD_Shape_float p)
- native void **upper_bound_assign** (Pointset_Powerset_BD_Shape_float p)
- native void **difference_assign** (Pointset_Powerset_BD_Shape_float p)
- native void **concatenate_assign** (Pointset_Powerset_BD_Shape_float p)
- native void **time_elapse_assign** (Pointset_Powerset_BD_Shape_float p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_BD_Shape_float y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_BD_Shape_float p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)

- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_BD_Shape_float_Iterator **begin_iterator** ()
- native Pointset_Powerset_BD_Shape_float_Iterator **end_iterator** ()
- native void **add_disjunct** (BD_Shape_float j_disj)
- native void **drop_disjunct** (Pointset_Powerset_BD_Shape_float_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_BD_Shape_float_Iterator itr1, Pointset_Powerset_BD_Shape_float_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_BD_Shape_float y)
- native void **BHZ03_H79_H79_widening_assign** (Pointset_Powerset_BD_Shape_float y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_BD_Shape_float y, Integer d)
- native void **BGP99_H79_extrapolation_assign** (Pointset_Powerset_BD_Shape_float y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Protected Member Functions

- native void **finalize** ()

### 10.82.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<float> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_float.java

## 10.83 parma_polyhedra_library.Pointset_Powerset_BD_Shape_float_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<float> >:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_BD_Shape_float_Iterator** (Pointset_Powerset_BD_Shape_float_Iterator y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_float_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native BD_Shape_float **get_disjunct** ()
- native void **free** ()

### Protected Member Functions

- native void **finalize** ()

### 10.83.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<float> >:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_float_Iterator.java

## 10.84 parma_polyhedra_library.Pointset_Powerset_BD_Shape_int16_t Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int16_t> >

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_BD_Shape_int16_t** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_BD_Shape_int16_t** (Pointset_Powerset_BD_Shape_int16_t y)
- **Pointset_Powerset_BD_Shape_int16_t** (BD_Shape_int16_t y)
- **Pointset_Powerset_BD_Shape_int16_t** (Pointset_Powerset_BD_Shape_int16_t y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_int16_t** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_int16_t** (Constraint_System cs)
- **Pointset_Powerset_BD_Shape_int16_t** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_BD_Shape_int16_t y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()

- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_BD_Shape_int16_t y)
- native boolean **strictly_contains** (Pointset_Powerset_BD_Shape_int16_t y)
- native boolean **is_disjoint_from** (Pointset_Powerset_BD_Shape_int16_t y)
- native boolean **geometrically_covers** (Pointset_Powerset_BD_Shape_int16_t y)
- native boolean **geometrically_equals** (Pointset_Powerset_BD_Shape_int16_t y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_int16_t p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_BD_Shape_int16_t p)
- native void **upper_bound_assign** (Pointset_Powerset_BD_Shape_int16_t p)
- native void **difference_assign** (Pointset_Powerset_BD_Shape_int16_t p)
- native void **concatenate_assign** (Pointset_Powerset_BD_Shape_int16_t p)
- native void **time_elapse_assign** (Pointset_Powerset_BD_Shape_int16_t p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_BD_Shape_int16_t y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_BD_Shape_int16_t p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)

- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_BD_Shape_int16_t_Iterator **begin_iterator** ()
- native Pointset_Powerset_BD_Shape_int16_t_Iterator **end_iterator** ()
- native void **add_disjunct** (BD_Shape_int16_t j_disj)
- native void **drop_disjunct** (Pointset_Powerset_BD_Shape_int16_t_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_BD_Shape_int16_t_Iterator itr1, Pointset_Powerset_BD_Shape_int16_t_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_BD_Shape_int16_t y)
- native void **BHZ03_H79_H79_widening_assign** (Pointset_Powerset_BD_Shape_int16_t y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_BD_Shape_int16_t y, Integer d)
- native void **BGP99_H79_extrapolation_assign** (Pointset_Powerset_BD_Shape_int16_t y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.84.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int16_t> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_int16_t.java

## 10.85 parma_polyhedra_library.Pointset_Powerset_BD_Shape_int16_t_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int16_t> >:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_BD_Shape_int16_t_Iterator** (Pointset_Powerset_BD_Shape_int16_t_Iterator y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_int16_t_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native BD_Shape_int16_t **get_disjunct** ()
- native void **free** ()

### Protected Member Functions

- native void **finalize** ()

### 10.85.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int16_t> >:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_int16_t_Iterator.java

## 10.86 parma_polyhedra_library.Pointset_Powerset_BD_Shape_int32_t Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int32_t> >

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_BD_Shape_int32_t** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_BD_Shape_int32_t** (Pointset_Powerset_BD_Shape_int32_t y)
- **Pointset_Powerset_BD_Shape_int32_t** (BD_Shape_int32_t y)
- **Pointset_Powerset_BD_Shape_int32_t** (Pointset_Powerset_BD_Shape_int32_t y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_int32_t** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_int32_t** (Constraint_System cs)
- **Pointset_Powerset_BD_Shape_int32_t** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_BD_Shape_int32_t y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)

- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_BD_Shape_int32_t y)
- native boolean **strictly_contains** (Pointset_Powerset_BD_Shape_int32_t y)
- native boolean **is_disjoint_from** (Pointset_Powerset_BD_Shape_int32_t y)
- native boolean **geometrically_covers** (Pointset_Powerset_BD_Shape_int32_t y)
- native boolean **geometrically_equals** (Pointset_Powerset_BD_Shape_int32_t y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_int32_t p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_BD_Shape_int32_t p)
- native void **upper_bound_assign** (Pointset_Powerset_BD_Shape_int32_t p)
- native void **difference_assign** (Pointset_Powerset_BD_Shape_int32_t p)
- native void **concatenate_assign** (Pointset_Powerset_BD_Shape_int32_t p)
- native void **time_elapse_assign** (Pointset_Powerset_BD_Shape_int32_t p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_BD_Shape_int32_t y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_BD_Shape_int32_t p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)

- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_BD_Shape_int32_t_Iterator **begin_iterator** ()
- native Pointset_Powerset_BD_Shape_int32_t_Iterator **end_iterator** ()
- native void **add_disjunct** (BD_Shape_int32_t j_disj)
- native void **drop_disjunct** (Pointset_Powerset_BD_Shape_int32_t_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_BD_Shape_int32_t_Iterator itr1, Pointset_Powerset-_BD_Shape_int32_t_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_BD_Shape_int32_t y)
- native void **BHZ03_H79_H79_widening_assign** (Pointset_Powerset_BD_Shape_int32_t y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_BD_Shape_int32_t y, Integer d)
- native void **BGP99_H79_extrapolation_assign** (Pointset_Powerset_BD_Shape_int32_t y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Protected Member Functions

- native void **finalize** ()

### 10.86.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int32_t> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_int32_t.java

## 10.87 parma_polyhedra_library.Pointset_Powerset_BD_Shape_int32_t_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int32_t> >:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_BD_Shape_int32_t_Iterator** (Pointset_Powerset_BD_Shape_int32_t_Iterator y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_int32_t_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native BD_Shape_int32_t **get_disjunct** ()
- native void **free** ()

### Protected Member Functions

- native void **finalize** ()

### 10.87.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int32_t> >:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_int32_t_Iterator.java

## 10.88 parma_polyhedra_library.Pointset_Powerset_BD_Shape_int64_t Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int64_t> >

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_BD_Shape_int64_t** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_BD_Shape_int64_t** (Pointset_Powerset_BD_Shape_int64_t y)
- **Pointset_Powerset_BD_Shape_int64_t** (BD_Shape_int64_t y)
- **Pointset_Powerset_BD_Shape_int64_t** (Pointset_Powerset_BD_Shape_int64_t y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_int64_t** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_int64_t** (Constraint_System cs)
- **Pointset_Powerset_BD_Shape_int64_t** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_BD_Shape_int64_t y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)

- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_BD_Shape_int64_t y)
- native boolean **strictly_contains** (Pointset_Powerset_BD_Shape_int64_t y)
- native boolean **is_disjoint_from** (Pointset_Powerset_BD_Shape_int64_t y)
- native boolean **geometrically_covers** (Pointset_Powerset_BD_Shape_int64_t y)
- native boolean **geometrically_equals** (Pointset_Powerset_BD_Shape_int64_t y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_int64_t p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_BD_Shape_int64_t p)
- native void **upper_bound_assign** (Pointset_Powerset_BD_Shape_int64_t p)
- native void **difference_assign** (Pointset_Powerset_BD_Shape_int64_t p)
- native void **concatenate_assign** (Pointset_Powerset_BD_Shape_int64_t p)
- native void **time_elapse_assign** (Pointset_Powerset_BD_Shape_int64_t p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_BD_Shape_int64_t y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_BD_Shape_int64_t p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)

- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_BD_Shape_int64_t_Iterator **begin_iterator** ()
- native Pointset_Powerset_BD_Shape_int64_t_Iterator **end_iterator** ()
- native void **add_disjunct** (BD_Shape_int64_t j_disj)
- native void **drop_disjunct** (Pointset_Powerset_BD_Shape_int64_t_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_BD_Shape_int64_t_Iterator itr1, Pointset_Powerset_BD_Shape_int64_t_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_BD_Shape_int64_t y)
- native void **BHZ03_H79_H79_widening_assign** (Pointset_Powerset_BD_Shape_int64_t y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_BD_Shape_int64_t y, Integer d)
- native void **BGP99_H79_extrapolation_assign** (Pointset_Powerset_BD_Shape_int64_t y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.88.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int64_t> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_int64_t.java

## 10.89 parma_polyhedra_library.Pointset_Powerset_BD_Shape_int64_t_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int64_t> >:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_BD_Shape_int64_t_Iterator** (Pointset_Powerset_BD_Shape_int64_t_Iterator y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_int64_t_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native BD_Shape_int64_t **get_disjunct** ()
- native void **free** ()

### Protected Member Functions

- native void **finalize** ()

### 10.89.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int64_t> >:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_int64_t_Iterator.java

## 10.90 parma_polyhedra_library.Pointset_Powerset_BD_Shape_int8_t Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int8_t> >

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_BD_Shape_int8_t** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_BD_Shape_int8_t** (Pointset_Powerset_BD_Shape_int8_t y)
- **Pointset_Powerset_BD_Shape_int8_t** (BD_Shape_int8_t y)
- **Pointset_Powerset_BD_Shape_int8_t** (Pointset_Powerset_BD_Shape_int8_t y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_int8_t** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_int8_t** (Constraint_System cs)
- **Pointset_Powerset_BD_Shape_int8_t** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_BD_Shape_int8_t y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)

- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_BD_Shape_int8_t y)
- native boolean **strictly_contains** (Pointset_Powerset_BD_Shape_int8_t y)
- native boolean **is_disjoint_from** (Pointset_Powerset_BD_Shape_int8_t y)
- native boolean **geometrically_covers** (Pointset_Powerset_BD_Shape_int8_t y)
- native boolean **geometrically_equals** (Pointset_Powerset_BD_Shape_int8_t y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_int8_t p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_BD_Shape_int8_t p)
- native void **upper_bound_assign** (Pointset_Powerset_BD_Shape_int8_t p)
- native void **difference_assign** (Pointset_Powerset_BD_Shape_int8_t p)
- native void **concatenate_assign** (Pointset_Powerset_BD_Shape_int8_t p)
- native void **time_elapse_assign** (Pointset_Powerset_BD_Shape_int8_t p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_BD_Shape_int8_t y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_BD_Shape_int8_t p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)

- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_BD_Shape_int8_t_Iterator **begin_iterator** ()
- native Pointset_Powerset_BD_Shape_int8_t_Iterator **end_iterator** ()
- native void **add_disjunct** (BD_Shape_int8_t j_disj)
- native void **drop_disjunct** (Pointset_Powerset_BD_Shape_int8_t_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_BD_Shape_int8_t_Iterator itr1, Pointset_Powerset-_BD_Shape_int8_t_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_BD_Shape_int8_t y)
- native void **BHZ03_H79_H79_widening_assign** (Pointset_Powerset_BD_Shape_int8_t y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_BD_Shape_int8_t y, Integer d)
- native void **BGP99_H79_extrapolation_assign** (Pointset_Powerset_BD_Shape_int8_t y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Protected Member Functions

- native void **finalize** ()

### 10.90.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int8_t> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_int8_t.java

## 10.91 parma_polyhedra_library.Pointset_Powerset_BD_Shape_int8_t_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int8_t> >:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_BD_Shape_int8_t_Iterator** (Pointset_Powerset_BD_Shape_int8_t_Iterator y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_int8_t_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native BD_Shape_int8_t **get_disjunct** ()
- native void **free** ()

### Protected Member Functions

- native void **finalize** ()

### 10.91.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<int8_t> >:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_int8_t_Iterator.java

## 10.92 parma_polyhedra_library.Pointset_Powerset_BD_Shape_long_double Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<long double> >

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_BD_Shape_long_double** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_BD_Shape_long_double** (Pointset_Powerset_BD_Shape_long_double y)
- **Pointset_Powerset_BD_Shape_long_double** (BD_Shape_long_double y)
- **Pointset_Powerset_BD_Shape_long_double** (Pointset_Powerset_BD_Shape_long_double y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_long_double** (BD_Shape_long_double y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_long_double** (Constraint_System cs)
- **Pointset_Powerset_BD_Shape_long_double** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_BD_Shape_long_double y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)

- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_BD_Shape_long_double y)
- native boolean **strictly_contains** (Pointset_Powerset_BD_Shape_long_double y)
- native boolean **is_disjoint_from** (Pointset_Powerset_BD_Shape_long_double y)
- native boolean **geometrically_covers** (Pointset_Powerset_BD_Shape_long_double y)
- native boolean **geometrically_equals** (Pointset_Powerset_BD_Shape_long_double y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_long_double p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_BD_Shape_long_double p)
- native void **upper_bound_assign** (Pointset_Powerset_BD_Shape_long_double p)
- native void **difference_assign** (Pointset_Powerset_BD_Shape_long_double p)
- native void **concatenate_assign** (Pointset_Powerset_BD_Shape_long_double p)
- native void **time_elapse_assign** (Pointset_Powerset_BD_Shape_long_double p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_BD_Shape_long_double y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_BD_Shape_long_double p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)

- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_BD_Shape_long_double_Iterator **begin_iterator** ()
- native Pointset_Powerset_BD_Shape_long_double_Iterator **end_iterator** ()
- native void **add_disjunct** (BD_Shape_long_double j_disj)
- native void **drop_disjunct** (Pointset_Powerset_BD_Shape_long_double_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_BD_Shape_long_double_Iterator itr1, Pointset_Powerset-_BD_Shape_long_double_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_BD_Shape_long_double y)
- native void **BHZ03_H79_H79_widening_assign** (Pointset_Powerset_BD_Shape_long_double y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_BD_Shape_long_double y, Integer d)
- native void **BGP99_H79_extrapolation_assign** (Pointset_Powerset_BD_Shape_long_double y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.92.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<long double> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_long_double.java

## 10.93 parma_polyhedra_library.Pointset_Powerset_BD_Shape_long_double_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<long double> >:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_BD_Shape_long_double_Iterator** (Pointset_Powerset_BD_Shape_long_double_Iterator y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_long_double_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native BD_Shape_long_double **get_disjunct** ()
- native void **free** ()

### Protected Member Functions

- native void **finalize** ()

#### 10.93.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<long double> >:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_long_double_Iterator.java

## 10.94 parma_polyhedra_library.Pointset_Powerset_BD_Shape_mpq_class Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<mpq_class> >

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_BD_Shape_mpq_class** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_BD_Shape_mpq_class** (Pointset_Powerset_BD_Shape_mpq_class y)
- **Pointset_Powerset_BD_Shape_mpq_class** (BD_Shape_mpq_class y)
- **Pointset_Powerset_BD_Shape_mpq_class** (Pointset_Powerset_BD_Shape_mpq_class y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_mpq_class** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_mpq_class** (Constraint_System cs)
- **Pointset_Powerset_BD_Shape_mpq_class** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_BD_Shape_mpq_class y)
- native long **space_dimension** ()
- native long **affine_dimension** ()

- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_BD_Shape_mpq_class y)
- native boolean **strictly_contains** (Pointset_Powerset_BD_Shape_mpq_class y)
- native boolean **is_disjoint_from** (Pointset_Powerset_BD_Shape_mpq_class y)
- native boolean **geometrically_covers** (Pointset_Powerset_BD_Shape_mpq_class y)
- native boolean **geometrically_equals** (Pointset_Powerset_BD_Shape_mpq_class y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_mpq_class p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_BD_Shape_mpq_class p)
- native void **upper_bound_assign** (Pointset_Powerset_BD_Shape_mpq_class p)
- native void **difference_assign** (Pointset_Powerset_BD_Shape_mpq_class p)
- native void **concatenate_assign** (Pointset_Powerset_BD_Shape_mpq_class p)
- native void **time_elapse_assign** (Pointset_Powerset_BD_Shape_mpq_class p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_BD_Shape_mpq_class y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_BD_Shape_mpq_class p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)

- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_BD_Shape_mpq_class_Iterator **begin_iterator** ()
- native Pointset_Powerset_BD_Shape_mpq_class_Iterator **end_iterator** ()
- native void **add_disjunct** (BD_Shape_mpq_class j_disj)
- native void **drop_disjunct** (Pointset_Powerset_BD_Shape_mpq_class_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_BD_Shape_mpq_class_Iterator itr1, Pointset_Powerset-_BD_Shape_mpq_class_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_BD_Shape_mpq_class y)
- native void **BHZ03_H79_H79_widening_assign** (Pointset_Powerset_BD_Shape_mpq_class y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_BD_Shape_mpq_class y, Integer d)
- native void **BGP99_H79_extrapolation_assign** (Pointset_Powerset_BD_Shape_mpq_class y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Protected Member Functions

- native void **finalize** ()

### 10.94.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<mpq_class> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_mpq_class.java

## 10.95 parma_polyhedra_library.Pointset_Powerset_BD_Shape_mpq_class_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<mpq_class> >:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_BD_Shape_mpq_class_Iterator** (Pointset_Powerset_BD_Shape_mpq_class_-Iterator y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_mpq_class_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native BD_Shape_mpq_class **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.95.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<mpq_class> >:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_mpq_class_Iterator.java

## 10.96 parma_polyhedra_library.Pointset_Powerset_BD_Shape_mpz_class Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<mpz_class> >

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_BD_Shape_mpz_class** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_BD_Shape_mpz_class** (Pointset_Powerset_BD_Shape_mpz_class y)
- **Pointset_Powerset_BD_Shape_mpz_class** (BD_Shape_mpz_class y)

- **Pointset_Powerset_BD_Shape_mpz_class** (Pointset_Powerset_BD_Shape_mpz_class y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_mpz_class** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Pointset_Powerset_BD_Shape_mpz_class** (Constraint_System cs)
- **Pointset_Powerset_BD_Shape_mpz_class** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_BD_Shape_mpz_class y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_BD_Shape_mpz_class y)
- native boolean **strictly_contains** (Pointset_Powerset_BD_Shape_mpz_class y)
- native boolean **is_disjoint_from** (Pointset_Powerset_BD_Shape_mpz_class y)
- native boolean **geometrically_covers** (Pointset_Powerset_BD_Shape_mpz_class y)
- native boolean **geometrically_equals** (Pointset_Powerset_BD_Shape_mpz_class y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_mpz_class p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_BD_Shape_mpz_class p)
- native void **upper_bound_assign** (Pointset_Powerset_BD_Shape_mpz_class p)
- native void **difference_assign** (Pointset_Powerset_BD_Shape_mpz_class p)

- native void **concatenate_assign** (Pointset_Powerset_BD_Shape_mpz_class p)
- native void **time_elapse_assign** (Pointset_Powerset_BD_Shape_mpz_class p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_BD_Shape_mpz_class y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_BD_Shape_mpz_class p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_BD_Shape_mpz_class_Iterator **begin_iterator** ()
- native Pointset_Powerset_BD_Shape_mpz_class_Iterator **end_iterator** ()
- native void **add_disjunct** (BD_Shape_mpz_class j_disj)
- native void **drop_disjunct** (Pointset_Powerset_BD_Shape_mpz_class_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_BD_Shape_mpz_class_Iterator itr1, Pointset_Powerset-_BD_Shape_mpz_class_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_BD_Shape_mpz_class y)
- native void **BHZ03_H79_H79_widening_assign** (Pointset_Powerset_BD_Shape_mpz_class y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_BD_Shape_mpz_class y, Integer d)
- native void **BGP99_H79_extrapolation_assign** (Pointset_Powerset_BD_Shape_mpz_class y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.96.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<mpz_class> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_mpz_class.java

## 10.97 parma_polyhedra_library.Pointset_Powerset_BD_Shape_mpz_class_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<mpz_class> >:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_BD_Shape_mpz_class_Iterator** (Pointset_Powerset_BD_Shape_mpz_class_-Iterator y)
- native boolean **equals** (Pointset_Powerset_BD_Shape_mpz_class_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native BD_Shape_mpz_class **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.97.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<BD_Shape<mpz_class> >:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_BD_Shape_mpz_class_Iterator.java

## 10.98 parma_polyhedra_library.Pointset_Powerset_C_Polyhedron Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<C_Polyhedron>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_C_Polyhedron** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_C_Polyhedron** (Pointset_Powerset_C_Polyhedron y)
- **Pointset_Powerset_C_Polyhedron** (C_Polyhedron y)
- **Pointset_Powerset_C_Polyhedron** (Pointset_Powerset_C_Polyhedron y, Complexity_Class complexity)
- **Pointset_Powerset_C_Polyhedron** (C_Polyhedron y, Complexity_Class complexity)
- **Pointset_Powerset_C_Polyhedron** (Constraint_System cs)
- **Pointset_Powerset_C_Polyhedron** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_C_Polyhedron y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_C_Polyhedron y)
- native boolean **strictly_contains** (Pointset_Powerset_C_Polyhedron y)
- native boolean **is_disjoint_from** (Pointset_Powerset_C_Polyhedron y)
- native boolean **geometrically_covers** (Pointset_Powerset_C_Polyhedron y)
- native boolean **geometrically_equals** (Pointset_Powerset_C_Polyhedron y)
- native boolean **equals** (Pointset_Powerset_C_Polyhedron p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)

- native void **intersection_assign** (Pointset_Powerset_C_Polyhedron p)
- native void **upper_bound_assign** (Pointset_Powerset_C_Polyhedron p)
- native void **difference_assign** (Pointset_Powerset_C_Polyhedron p)
- native void **concatenate_assign** (Pointset_Powerset_C_Polyhedron p)
- native void **time_elapse_assign** (Pointset_Powerset_C_Polyhedron p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_C_Polyhedron y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_C_Polyhedron p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_C_Polyhedron_Iterator **begin_iterator** ()
- native Pointset_Powerset_C_Polyhedron_Iterator **end_iterator** ()
- native void **add_disjunct** (C_Polyhedron j_disj)
- native void **drop_disjunct** (Pointset_Powerset_C_Polyhedron_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_C_Polyhedron_Iterator itr1, Pointset_Powerset_C-_Polyhedron_Iterator itr2)
- native void **BHZ03_BHRZ03_BHRZ03_widening_assign** (Pointset_Powerset_C_Polyhedron y)
- native void **BHZ03_H79_H79_widening_assign** (Pointset_Powerset_C_Polyhedron y)
- native void **BGP99_BHRZ03_extrapolation_assign** (Pointset_Powerset_C_Polyhedron y, Integer d)
- native void **BGP99_H79_extrapolation_assign** (Pointset_Powerset_C_Polyhedron y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.98.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<C_Polyhedron>

The documentation for this class was generated from the following file:

- Pointset_Powerset_C_Polyhedron.java

## 10.99 parma_polyhedra_library.Pointset_Powerset_C_Polyhedron_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<C_Polyhedron>:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_C_Polyhedron_Iterator** (Pointset_Powerset_C_Polyhedron_Iterator y)
- native boolean **equals** (Pointset_Powerset_C_Polyhedron_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native C_Polyhedron **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.99.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<C_Polyhedron>:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_C_Polyhedron_Iterator.java

## 10.100 parma_polyhedra_library.Pointset_Powerset_Double_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Double_Box>

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Double_Box** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Double_Box** (Pointset_Powerset_Double_Box y)
- **Pointset_Powerset_Double_Box** (Double_Box y)

- **Pointset_Powerset_Double_Box** (Pointset_Powerset_Double_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Double_Box** (Double_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Double_Box** (Constraint_System cs)
- **Pointset_Powerset_Double_Box** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Double_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Double_Box y)
- native boolean **strictly_contains** (Pointset_Powerset_Double_Box y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Double_Box y)
- native boolean **geometrically_covers** (Pointset_Powerset_Double_Box y)
- native boolean **geometrically_equals** (Pointset_Powerset_Double_Box y)
- native boolean **equals** (Pointset_Powerset_Double_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Double_Box p)
- native void **upper_bound_assign** (Pointset_Powerset_Double_Box p)
- native void **difference_assign** (Pointset_Powerset_Double_Box p)
- native void **concatenate_assign** (Pointset_Powerset_Double_Box p)

- native void **time_elapse_assign** (Pointset_Powerset_Double_Box p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Double_Box y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Double_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Double_Box_Iterator **begin_iterator** ()
- native Pointset_Powerset_Double_Box_Iterator **end_iterator** ()
- native void **add_disjunct** (Double_Box j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Double_Box_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Double_Box_Iterator itr1, Pointset_Powerset_Double-_Box_Iterator itr2)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Protected Member Functions

- native void **finalize** ()

### 10.100.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Double_Box>

The documentation for this class was generated from the following file:

- Pointset_Powerset_Double_Box.java

## 10.101 parma_polyhedra_library.Pointset_Powerset_Double_Box_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Double_Box>:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Double_Box_Iterator** (Pointset_Powerset_Double_Box_Iterator y)
- native boolean **equals** (Pointset_Powerset_Double_Box_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Double_Box **get_disjunct** ()
- native void **free** ()

### Protected Member Functions

- native void **finalize** ()

### 10.101.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Double_Box>:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Double_Box_Iterator.java

## 10.102 parma_polyhedra_library.Pointset_Powerset_Float_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Float_Box>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Float_Box** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Float_Box** (Pointset_Powerset_Float_Box y)
- **Pointset_Powerset_Float_Box** (Float_Box y)
- **Pointset_Powerset_Float_Box** (Pointset_Powerset_Float_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Float_Box** (Float_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Float_Box** (Constraint_System cs)
- **Pointset_Powerset_Float_Box** (Congruence_System cs)

- native void **swap** (Pointset_Powerset_Float_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Float_Box y)
- native boolean **strictly_contains** (Pointset_Powerset_Float_Box y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Float_Box y)
- native boolean **geometrically_covers** (Pointset_Powerset_Float_Box y)
- native boolean **geometrically_equals** (Pointset_Powerset_Float_Box y)
- native boolean **equals** (Pointset_Powerset_Float_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Float_Box p)
- native void **upper_bound_assign** (Pointset_Powerset_Float_Box p)
- native void **difference_assign** (Pointset_Powerset_Float_Box p)
- native void **concatenate_assign** (Pointset_Powerset_Float_Box p)
- native void **time_elapse_assign** (Pointset_Powerset_Float_Box p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Float_Box y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Float_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)

- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Float_Box_Iterator **begin_iterator** ()
- native Pointset_Powerset_Float_Box_Iterator **end_iterator** ()
- native void **add_disjunct** (Float_Box j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Float_Box_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Float_Box_Iterator itr1, Pointset_Powerset_Float_Box_Iterator itr2)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Protected Member Functions

- native void **finalize** ()

### 10.102.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Float_Box>

The documentation for this class was generated from the following file:

- Pointset_Powerset_Float_Box.java

## 10.103 parma_polyhedra_library.Pointset_Powerset_Float_Box_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Float_Box>:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Float_Box_Iterator** (Pointset_Powerset_Float_Box_Iterator y)
- native boolean **equals** (Pointset_Powerset_Float_Box_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Float_Box **get_disjunct** ()
- native void **free** ()

### Protected Member Functions

- native void **finalize** ()

### 10.103.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Float_Box>:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Float_Box_Iterator.java

## 10.104 parma_polyhedra_library.Pointset_Powerset_Grid Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Grid>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Grid** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Grid** (Pointset_Powerset_Grid y)
- **Pointset_Powerset_Grid** (Grid y)
- **Pointset_Powerset_Grid** (Pointset_Powerset_Grid y, Complexity_Class complexity)
- **Pointset_Powerset_Grid** (Grid y, Complexity_Class complexity)
- **Pointset_Powerset_Grid** (Constraint_System cs)
- **Pointset_Powerset_Grid** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Grid y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()

- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Grid y)
- native boolean **strictly_contains** (Pointset_Powerset_Grid y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Grid y)
- native boolean **geometrically_covers** (Pointset_Powerset_Grid y)
- native boolean **geometrically_equals** (Pointset_Powerset_Grid y)
- native boolean **equals** (Pointset_Powerset_Grid p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Grid p)
- native void **upper_bound_assign** (Pointset_Powerset_Grid p)
- native void **difference_assign** (Pointset_Powerset_Grid p)
- native void **concatenate_assign** (Pointset_Powerset_Grid p)
- native void **time_elapse_assign** (Pointset_Powerset_Grid p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Grid y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Grid p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)

- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Grid_Iterator **begin_iterator** ()
- native Pointset_Powerset_Grid_Iterator **end_iterator** ()
- native void **add_disjunct** (Grid j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Grid_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Grid_Iterator itr1, Pointset_Powerset_Grid_Iterator itr2)
- native void **BHZ03_Grid_congruence_widening_assign** (Pointset_Powerset_Grid y)
- native void **BHZ03_Grid_generator_widening_assign** (Pointset_Powerset_Grid y)
- native void **BGP99_congruence_extrapolation_assign** (Pointset_Powerset_Grid y, Integer d)
- native void **BGP99_generator_extrapolation_assign** (Pointset_Powerset_Grid y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.104.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Grid>

The documentation for this class was generated from the following file:

- Pointset_Powerset_Grid.java

## 10.105 parma_polyhedra_library.Pointset_Powerset_Grid_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Grid>:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Grid_Iterator** (Pointset_Powerset_Grid_Iterator y)
- native boolean **equals** (Pointset_Powerset_Grid_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Grid **get_disjunct** ()
- native void **free** ()

### Protected Member Functions

- native void **finalize** ()

#### 10.105.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Grid>:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Grid_Iterator.java

## 10.106 parma_polyhedra_library.Pointset_Powerset_Int16_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int16_Box>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Int16_Box** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Int16_Box** (Pointset_Powerset_Int16_Box y)
- **Pointset_Powerset_Int16_Box** (Int16_Box y)
- **Pointset_Powerset_Int16_Box** (Pointset_Powerset_Int16_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Int16_Box** (Int16_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Int16_Box** (Constraint_System cs)
- **Pointset_Powerset_Int16_Box** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Int16_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()

- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Int16_Box y)
- native boolean **strictly_contains** (Pointset_Powerset_Int16_Box y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Int16_Box y)
- native boolean **geometrically_covers** (Pointset_Powerset_Int16_Box y)
- native boolean **geometrically_equals** (Pointset_Powerset_Int16_Box y)
- native boolean **equals** (Pointset_Powerset_Int16_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Int16_Box p)
- native void **upper_bound_assign** (Pointset_Powerset_Int16_Box p)
- native void **difference_assign** (Pointset_Powerset_Int16_Box p)
- native void **concatenate_assign** (Pointset_Powerset_Int16_Box p)
- native void **time_elapse_assign** (Pointset_Powerset_Int16_Box p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Int16_Box y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Int16_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)

- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Int16_Box_Iterator **begin_iterator** ()
- native Pointset_Powerset_Int16_Box_Iterator **end_iterator** ()
- native void **add_disjunct** (Int16_Box j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Int16_Box_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Int16_Box_Iterator itr1, Pointset_Powerset_Int16_Box_Iterator itr2)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.106.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int16_Box>

The documentation for this class was generated from the following file:

- Pointset_Powerset_Int16_Box.java

## 10.107 parma_polyhedra_library.Pointset_Powerset_Int16_Box_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int16_Box>:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Int16_Box_Iterator** (Pointset_Powerset_Int16_Box_Iterator y)
- native boolean **equals** (Pointset_Powerset_Int16_Box_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Int16_Box **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.107.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int16_Box>:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Int16_Box_Iterator.java

## 10.108 parma_polyhedra_library.Pointset_Powerset_Int32_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int32_Box>

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Int32_Box** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Int32_Box** (Pointset_Powerset_Int32_Box y)
- **Pointset_Powerset_Int32_Box** (Int32_Box y)
- **Pointset_Powerset_Int32_Box** (Pointset_Powerset_Int32_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Int32_Box** (Int32_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Int32_Box** (Constraint_System cs)
- **Pointset_Powerset_Int32_Box** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Int32_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)

- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Int32_Box y)
- native boolean **strictly_contains** (Pointset_Powerset_Int32_Box y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Int32_Box y)
- native boolean **geometrically_covers** (Pointset_Powerset_Int32_Box y)
- native boolean **geometrically_equals** (Pointset_Powerset_Int32_Box y)
- native boolean **equals** (Pointset_Powerset_Int32_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Int32_Box p)
- native void **upper_bound_assign** (Pointset_Powerset_Int32_Box p)
- native void **difference_assign** (Pointset_Powerset_Int32_Box p)
- native void **concatenate_assign** (Pointset_Powerset_Int32_Box p)
- native void **time_elapse_assign** (Pointset_Powerset_Int32_Box p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Int32_Box y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Int32_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)

- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Int32_Box_Iterator **begin_iterator** ()
- native Pointset_Powerset_Int32_Box_Iterator **end_iterator** ()
- native void **add_disjunct** (Int32_Box j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Int32_Box_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Int32_Box_Iterator itr1, Pointset_Powerset_Int32_Box_Iterator itr2)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.108.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int32_Box>

The documentation for this class was generated from the following file:

- Pointset_Powerset_Int32_Box.java

## 10.109 parma_polyhedra_library.Pointset_Powerset_Int32_Box_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int32_Box>:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Int32_Box_Iterator** (Pointset_Powerset_Int32_Box_Iterator y)
- native boolean **equals** (Pointset_Powerset_Int32_Box_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Int32_Box **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.109.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int32_Box>:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Int32_Box_Iterator.java

## 10.110 parma_polyhedra_library.Pointset_Powerset_Int64_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int64_Box>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Int64_Box** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Int64_Box** (Pointset_Powerset_Int64_Box y)
- **Pointset_Powerset_Int64_Box** (Int64_Box y)
- **Pointset_Powerset_Int64_Box** (Pointset_Powerset_Int64_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Int64_Box** (Int64_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Int64_Box** (Constraint_System cs)
- **Pointset_Powerset_Int64_Box** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Int64_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Int64_Box y)
- native boolean **strictly_contains** (Pointset_Powerset_Int64_Box y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Int64_Box y)

- native boolean **geometrically_covers** (Pointset_Powerset_Int64_Box y)
- native boolean **geometrically_equals** (Pointset_Powerset_Int64_Box y)
- native boolean **equals** (Pointset_Powerset_Int64_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Int64_Box p)
- native void **upper_bound_assign** (Pointset_Powerset_Int64_Box p)
- native void **difference_assign** (Pointset_Powerset_Int64_Box p)
- native void **concatenate_assign** (Pointset_Powerset_Int64_Box p)
- native void **time_elapse_assign** (Pointset_Powerset_Int64_Box p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Int64_Box y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Int64_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()

- native Pointset_Powerset_Int64_Box_Iterator **begin_iterator** ()
- native Pointset_Powerset_Int64_Box_Iterator **end_iterator** ()
- native void **add_disjunct** (Int64_Box j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Int64_Box_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Int64_Box_Iterator itr1, Pointset_Powerset_Int64_Box_Iterator itr2)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.110.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int64_Box>

The documentation for this class was generated from the following file:

- Pointset_Powerset_Int64_Box.java

## 10.111 parma_polyhedra_library.Pointset_Powerset_Int64_Box_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int64_Box>:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Int64_Box_Iterator** (Pointset_Powerset_Int64_Box_Iterator y)
- native boolean **equals** (Pointset_Powerset_Int64_Box_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Int64_Box **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.111.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int64_Box>:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Int64_Box_Iterator.java

## 10.112 parma_polyhedra_library.Pointset_Powerset_Int8_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int8_Box>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Int8_Box** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Int8_Box** (Pointset_Powerset_Int8_Box y)
- **Pointset_Powerset_Int8_Box** (Int8_Box y)
- **Pointset_Powerset_Int8_Box** (Pointset_Powerset_Int8_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Int8_Box** (Int8_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Int8_Box** (Constraint_System cs)
- **Pointset_Powerset_Int8_Box** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Int8_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Int8_Box y)
- native boolean **strictly_contains** (Pointset_Powerset_Int8_Box y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Int8_Box y)
- native boolean **geometrically_covers** (Pointset_Powerset_Int8_Box y)
- native boolean **geometrically_equals** (Pointset_Powerset_Int8_Box y)
- native boolean **equals** (Pointset_Powerset_Int8_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)

- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Int8_Box p)
- native void **upper_bound_assign** (Pointset_Powerset_Int8_Box p)
- native void **difference_assign** (Pointset_Powerset_Int8_Box p)
- native void **concatenate_assign** (Pointset_Powerset_Int8_Box p)
- native void **time_elapse_assign** (Pointset_Powerset_Int8_Box p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Int8_Box y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Int8_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Int8_Box_Iterator **begin_iterator** ()
- native Pointset_Powerset_Int8_Box_Iterator **end_iterator** ()
- native void **add_disjunct** (Int8_Box j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Int8_Box_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Int8_Box_Iterator itr1, Pointset_Powerset_Int8_Box_Iterator itr2)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.112.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int8_Box>

The documentation for this class was generated from the following file:

- Pointset_Powerset_Int8_Box.java

## 10.113 parma_polyhedra_library.Pointset_Powerset_Int8_Box_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int8_Box>:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Int8_Box_Iterator** (Pointset_Powerset_Int8_Box_Iterator y)
- native boolean **equals** (Pointset_Powerset_Int8_Box_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Int8_Box **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.113.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Int8_Box>:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Int8_Box_Iterator.java

## 10.114 parma_polyhedra_library.Pointset_Powerset_Long_Double_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Long_Double_Box>

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Long_Double_Box** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Long_Double_Box** (Pointset_Powerset_Long_Double_Box y)
- **Pointset_Powerset_Long_Double_Box** (Long_Double_Box y)

- **Pointset_Powerset_Long_Double_Box** (Pointset_Powerset_Long_Double_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Long_Double_Box** (Long_Double_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Long_Double_Box** (Constraint_System cs)
- **Pointset_Powerset_Long_Double_Box** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Long_Double_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Long_Double_Box y)
- native boolean **strictly_contains** (Pointset_Powerset_Long_Double_Box y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Long_Double_Box y)
- native boolean **geometrically_covers** (Pointset_Powerset_Long_Double_Box y)
- native boolean **geometrically_equals** (Pointset_Powerset_Long_Double_Box y)
- native boolean **equals** (Pointset_Powerset_Long_Double_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Long_Double_Box p)
- native void **upper_bound_assign** (Pointset_Powerset_Long_Double_Box p)
- native void **difference_assign** (Pointset_Powerset_Long_Double_Box p)
- native void **concatenate_assign** (Pointset_Powerset_Long_Double_Box p)

- native void **time_elapse_assign** (Pointset_Powerset_Long_Double_Box p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Long_Double_Box y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Long_Double_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Long_Double_Box_Iterator **begin_iterator** ()
- native Pointset_Powerset_Long_Double_Box_Iterator **end_iterator** ()
- native void **add_disjunct** (Long_Double_Box j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Long_Double_Box_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Long_Double_Box_Iterator itr1, Pointset_Powerset-_Long_Double_Box_Iterator itr2)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Protected Member Functions

- native void **finalize** ()

### 10.114.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Long_Double_Box>

The documentation for this class was generated from the following file:

- Pointset_Powerset_Long_Double_Box.java

## 10.115 parma_polyhedra_library.Pointset_Powerset_Long_Double_Box_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Long_Double_Box>:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Long_Double_Box_Iterator** (Pointset_Powerset_Long_Double_Box_Iterator y)
- native boolean **equals** (Pointset_Powerset_Long_Double_Box_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Long_Double_Box **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.115.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Long_Double_Box>:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Long_Double_Box_Iterator.java

## 10.116 parma_polyhedra_library.Pointset_Powerset_NNC_Polyhedron Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<NNC_Polyhedron>

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_NNC_Polyhedron** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_NNC_Polyhedron** (Pointset_Powerset_NNC_Polyhedron y)
- **Pointset_Powerset_NNC_Polyhedron** (NNC_Polyhedron y)
- **Pointset_Powerset_NNC_Polyhedron** (Pointset_Powerset_NNC_Polyhedron y, Complexity_Class complexity)
- **Pointset_Powerset_NNC_Polyhedron** (NNC_Polyhedron y, Complexity_Class complexity)

- **Pointset_Powerset_NNC_Polyhedron** (Constraint_System cs)
- **Pointset_Powerset_NNC_Polyhedron** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_NNC_Polyhedron y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_NNC_Polyhedron y)
- native boolean **strictly_contains** (Pointset_Powerset_NNC_Polyhedron y)
- native boolean **is_disjoint_from** (Pointset_Powerset_NNC_Polyhedron y)
- native boolean **geometrically_covers** (Pointset_Powerset_NNC_Polyhedron y)
- native boolean **geometrically_equals** (Pointset_Powerset_NNC_Polyhedron y)
- native boolean **equals** (Pointset_Powerset_NNC_Polyhedron p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_NNC_Polyhedron p)
- native void **upper_bound_assign** (Pointset_Powerset_NNC_Polyhedron p)
- native void **difference_assign** (Pointset_Powerset_NNC_Polyhedron p)
- native void **concatenate_assign** (Pointset_Powerset_NNC_Polyhedron p)
- native void **time_elapse_assign** (Pointset_Powerset_NNC_Polyhedron p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_NNC_Polyhedron y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_NNC_Polyhedron p)

- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_NNC_Polyhedron_Iterator **begin_iterator** ()
- native Pointset_Powerset_NNC_Polyhedron_Iterator **end_iterator** ()
- native void **add_disjunct** (NNC_Polyhedron j_disj)
- native void **drop_disjunct** (Pointset_Powerset_NNC_Polyhedron_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_NNC_Polyhedron_Iterator itr1, Pointset_Powerset-_NNC_Polyhedron_Iterator itr2)
- native void **BHZ03_BHRZ03_BHRZ03_widening_assign** (Pointset_Powerset_NNC_Polyhedron y)
- native void **BHZ03_H79_H79_widening_assign** (Pointset_Powerset_NNC_Polyhedron y)
- native void **BGP99_BHRZ03_extrapolation_assign** (Pointset_Powerset_NNC_Polyhedron y, Integer d)
- native void **BGP99_H79_extrapolation_assign** (Pointset_Powerset_NNC_Polyhedron y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Protected Member Functions

- native void **finalize** ()

### 10.116.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<NNC_Polyhedron>

The documentation for this class was generated from the following file:

- Pointset_Powerset_NNC_Polyhedron.java

## 10.117 parma_polyhedra_library.Pointset_Powerset_NNC_Polyhedron_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<NNC_Polyhedron>:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_NNC_Polyhedron_Iterator** (Pointset_Powerset_NNC_Polyhedron_Iterator y)
- native boolean **equals** (Pointset_Powerset_NNC_Polyhedron_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native NNC_Polyhedron **get_disjunct** ()
- native void **free** ()

### Protected Member Functions

- native void **finalize** ()

### 10.117.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<NNC_Polyhedron>:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_NNC_Polyhedron_Iterator.java

## 10.118 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_double Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<double> >

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_double** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Octagonal_Shape_double** (Pointset_Powerset_Octagonal_Shape_double y)
- **Pointset_Powerset_Octagonal_Shape_double** (Octagonal_Shape_double y)
- **Pointset_Powerset_Octagonal_Shape_double** (Pointset_Powerset_Octagonal_Shape_double y, Complexity_Class complexity)

- **Pointset_Powerset_Octagonal_Shape_double** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_double** (Constraint_System cs)
- **Pointset_Powerset_Octagonal_Shape_double** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Octagonal_Shape_double y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Octagonal_Shape_double y)
- native boolean **strictly_contains** (Pointset_Powerset_Octagonal_Shape_double y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Octagonal_Shape_double y)
- native boolean **geometrically_covers** (Pointset_Powerset_Octagonal_Shape_double y)
- native boolean **geometrically_equals** (Pointset_Powerset_Octagonal_Shape_double y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_double p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Octagonal_Shape_double p)
- native void **upper_bound_assign** (Pointset_Powerset_Octagonal_Shape_double p)
- native void **difference_assign** (Pointset_Powerset_Octagonal_Shape_double p)
- native void **concatenate_assign** (Pointset_Powerset_Octagonal_Shape_double p)
- native void **time_elapse_assign** (Pointset_Powerset_Octagonal_Shape_double p)

- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Octagonal_Shape_double y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Octagonal_Shape_double p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Octagonal_Shape_double_Iterator **begin_iterator** ()
- native Pointset_Powerset_Octagonal_Shape_double_Iterator **end_iterator** ()
- native void **add_disjunct** (Octagonal_Shape_double j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Octagonal_Shape_double_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Octagonal_Shape_double_Iterator itr1, Pointset_-Powerset_Octagonal_Shape_double_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_Octagonal_Shape_double y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_Octagonal_Shape_double y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Protected Member Functions

- native void **finalize** ()

### 10.118.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<double> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_double.java

## 10.119 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_double_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<double> >-:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_double_Iterator** (Pointset_Powerset_Octagonal_Shape_double-_Iterator y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_double_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Octagonal_Shape_double **get_disjunct** ()
- native void **free** ()

### Protected Member Functions

- native void **finalize** ()

### 10.119.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<double> >-:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_double_Iterator.java

## 10.120 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_float Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<float> >

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_float** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Octagonal_Shape_float** (Pointset_Powerset_Octagonal_Shape_float y)
- **Pointset_Powerset_Octagonal_Shape_float** (Octagonal_Shape_float y)

- **Pointset_Powerset_Octagonal_Shape_float** (Pointset_Powerset_Octagonal_Shape_float y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_float** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_float** (Constraint_System cs)
- **Pointset_Powerset_Octagonal_Shape_float** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Octagonal_Shape_float y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Octagonal_Shape_float y)
- native boolean **strictly_contains** (Pointset_Powerset_Octagonal_Shape_float y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Octagonal_Shape_float y)
- native boolean **geometrically_covers** (Pointset_Powerset_Octagonal_Shape_float y)
- native boolean **geometrically_equals** (Pointset_Powerset_Octagonal_Shape_float y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_float p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Octagonal_Shape_float p)
- native void **upper_bound_assign** (Pointset_Powerset_Octagonal_Shape_float p)
- native void **difference_assign** (Pointset_Powerset_Octagonal_Shape_float p)

- native void **concatenate_assign** (Pointset_Powerset_Octagonal_Shape_float p)
- native void **time_elapse_assign** (Pointset_Powerset_Octagonal_Shape_float p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Octagonal_Shape_float y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Octagonal_Shape_float p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Octagonal_Shape_float_Iterator **begin_iterator** ()
- native Pointset_Powerset_Octagonal_Shape_float_Iterator **end_iterator** ()
- native void **add_disjunct** (Octagonal_Shape_float j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Octagonal_Shape_float_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Octagonal_Shape_float_Iterator itr1, Pointset_Powerset-_Octagonal_Shape_float_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_Octagonal_Shape_float y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_Octagonal_Shape_float y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.120.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<float> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_float.java

## 10.121 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_float_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<float> >:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_float_Iterator** (Pointset_Powerset_Octagonal_Shape_float_Iterator y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_float_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Octagonal_Shape_float **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.121.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<float> >:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_float_Iterator.java

## 10.122 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_int16_t Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int16_t> >

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_int16_t** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Octagonal_Shape_int16_t** (Pointset_Powerset_Octagonal_Shape_int16_t y)
- **Pointset_Powerset_Octagonal_Shape_int16_t** (Octagonal_Shape_int16_t y)
- **Pointset_Powerset_Octagonal_Shape_int16_t** (Pointset_Powerset_Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_int16_t** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_int16_t** (Constraint_System cs)
- **Pointset_Powerset_Octagonal_Shape_int16_t** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Octagonal_Shape_int16_t y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Octagonal_Shape_int16_t y)
- native boolean **strictly_contains** (Pointset_Powerset_Octagonal_Shape_int16_t y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Octagonal_Shape_int16_t y)
- native boolean **geometrically_covers** (Pointset_Powerset_Octagonal_Shape_int16_t y)
- native boolean **geometrically_equals** (Pointset_Powerset_Octagonal_Shape_int16_t y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_int16_t p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)

- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Octagonal_Shape_int16_t p)
- native void **upper_bound_assign** (Pointset_Powerset_Octagonal_Shape_int16_t p)
- native void **difference_assign** (Pointset_Powerset_Octagonal_Shape_int16_t p)
- native void **concatenate_assign** (Pointset_Powerset_Octagonal_Shape_int16_t p)
- native void **time_elapse_assign** (Pointset_Powerset_Octagonal_Shape_int16_t p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Octagonal_Shape_int16_t y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Octagonal_Shape_int16_t p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Octagonal_Shape_int16_t_Iterator **begin_iterator** ()
- native Pointset_Powerset_Octagonal_Shape_int16_t_Iterator **end_iterator** ()
- native void **add_disjunct** (Octagonal_Shape_int16_t j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Octagonal_Shape_int16_t_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Octagonal_Shape_int16_t_Iterator itr1, Pointset_-Powerset_Octagonal_Shape_int16_t_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_Octagonal_Shape_int16-_t y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_Octagonal_Shape_int16-_t y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Protected Member Functions

- native void **finalize** ()

#### 10.122.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int16_t> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_int16_t.java

## 10.123 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_int16_t_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int16_t> >-:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_int16_t_Iterator** (Pointset_Powerset_Octagonal_Shape_int16-_t_Iterator y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_int16_t_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Octagonal_Shape_int16_t **get_disjunct** ()
- native void **free** ()

### Protected Member Functions

- native void **finalize** ()

#### 10.123.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int16_t> >-:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_int16_t_Iterator.java

## 10.124 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_int32_t Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int32_t> >

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_int32_t** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Octagonal_Shape_int32_t** (Pointset_Powerset_Octagonal_Shape_int32_t y)
- **Pointset_Powerset_Octagonal_Shape_int32_t** (Octagonal_Shape_int32_t y)
- **Pointset_Powerset_Octagonal_Shape_int32_t** (Pointset_Powerset_Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_int32_t** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_int32_t** (Constraint_System cs)
- **Pointset_Powerset_Octagonal_Shape_int32_t** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Octagonal_Shape_int32_t y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Octagonal_Shape_int32_t y)
- native boolean **strictly_contains** (Pointset_Powerset_Octagonal_Shape_int32_t y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Octagonal_Shape_int32_t y)
- native boolean **geometrically_covers** (Pointset_Powerset_Octagonal_Shape_int32_t y)
- native boolean **geometrically_equals** (Pointset_Powerset_Octagonal_Shape_int32_t y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_int32_t p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)

- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Octagonal_Shape_int32_t p)
- native void **upper_bound_assign** (Pointset_Powerset_Octagonal_Shape_int32_t p)
- native void **difference_assign** (Pointset_Powerset_Octagonal_Shape_int32_t p)
- native void **concatenate_assign** (Pointset_Powerset_Octagonal_Shape_int32_t p)
- native void **time_elapse_assign** (Pointset_Powerset_Octagonal_Shape_int32_t p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Octagonal_Shape_int32_t y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Octagonal_Shape_int32_t p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Octagonal_Shape_int32_t_Iterator **begin_iterator** ()
- native Pointset_Powerset_Octagonal_Shape_int32_t_Iterator **end_iterator** ()
- native void **add_disjunct** (Octagonal_Shape_int32_t j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Octagonal_Shape_int32_t_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Octagonal_Shape_int32_t_Iterator itr1, Pointset_-Powerset_Octagonal_Shape_int32_t_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_Octagonal_Shape_int32-_t y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_Octagonal_Shape_int32-_t y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.124.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int32_t> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_int32_t.java

## 10.125 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_int32_t_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int32_t> >-:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_int32_t_Iterator** (Pointset_Powerset_Octagonal_Shape_int32-_t_Iterator y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_int32_t_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Octagonal_Shape_int32_t **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.125.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int32_t> >-:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_int32_t_Iterator.java

## 10.126 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_int64_t Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int64_t> >

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_int64_t** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Octagonal_Shape_int64_t** (Pointset_Powerset_Octagonal_Shape_int64_t y)
- **Pointset_Powerset_Octagonal_Shape_int64_t** (Octagonal_Shape_int64_t y)
- **Pointset_Powerset_Octagonal_Shape_int64_t** (Pointset_Powerset_Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_int64_t** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_int64_t** (Constraint_System cs)
- **Pointset_Powerset_Octagonal_Shape_int64_t** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Octagonal_Shape_int64_t y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Octagonal_Shape_int64_t y)
- native boolean **strictly_contains** (Pointset_Powerset_Octagonal_Shape_int64_t y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Octagonal_Shape_int64_t y)
- native boolean **geometrically_covers** (Pointset_Powerset_Octagonal_Shape_int64_t y)
- native boolean **geometrically_equals** (Pointset_Powerset_Octagonal_Shape_int64_t y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_int64_t p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)

- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Octagonal_Shape_int64_t p)
- native void **upper_bound_assign** (Pointset_Powerset_Octagonal_Shape_int64_t p)
- native void **difference_assign** (Pointset_Powerset_Octagonal_Shape_int64_t p)
- native void **concatenate_assign** (Pointset_Powerset_Octagonal_Shape_int64_t p)
- native void **time_elapse_assign** (Pointset_Powerset_Octagonal_Shape_int64_t p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Octagonal_Shape_int64_t y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Octagonal_Shape_int64_t p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Octagonal_Shape_int64_t_Iterator **begin_iterator** ()
- native Pointset_Powerset_Octagonal_Shape_int64_t_Iterator **end_iterator** ()
- native void **add_disjunct** (Octagonal_Shape_int64_t j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Octagonal_Shape_int64_t_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Octagonal_Shape_int64_t_Iterator itr1, Pointset_-Powerset_Octagonal_Shape_int64_t_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_Octagonal_Shape_int64-_t y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_Octagonal_Shape_int64-_t y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Protected Member Functions

- native void **finalize** ()

#### 10.126.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int64_t> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_int64_t.java

## 10.127 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_int64_t_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int64_t> >-:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_int64_t_Iterator** (Pointset_Powerset_Octagonal_Shape_int64-_t_Iterator y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_int64_t_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Octagonal_Shape_int64_t **get_disjunct** ()
- native void **free** ()

### Protected Member Functions

- native void **finalize** ()

#### 10.127.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int64_t> >-:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_int64_t_Iterator.java

## 10.128 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_int8_t Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int8_t> >

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_int8_t** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Octagonal_Shape_int8_t** (Pointset_Powerset_Octagonal_Shape_int8_t y)
- **Pointset_Powerset_Octagonal_Shape_int8_t** (Octagonal_Shape_int8_t y)
- **Pointset_Powerset_Octagonal_Shape_int8_t** (Pointset_Powerset_Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_int8_t** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_int8_t** (Constraint_System cs)
- **Pointset_Powerset_Octagonal_Shape_int8_t** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Octagonal_Shape_int8_t y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Octagonal_Shape_int8_t y)
- native boolean **strictly_contains** (Pointset_Powerset_Octagonal_Shape_int8_t y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Octagonal_Shape_int8_t y)
- native boolean **geometrically_covers** (Pointset_Powerset_Octagonal_Shape_int8_t y)
- native boolean **geometrically_equals** (Pointset_Powerset_Octagonal_Shape_int8_t y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_int8_t p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)

- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Octagonal_Shape_int8_t p)
- native void **upper_bound_assign** (Pointset_Powerset_Octagonal_Shape_int8_t p)
- native void **difference_assign** (Pointset_Powerset_Octagonal_Shape_int8_t p)
- native void **concatenate_assign** (Pointset_Powerset_Octagonal_Shape_int8_t p)
- native void **time_elapse_assign** (Pointset_Powerset_Octagonal_Shape_int8_t p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Octagonal_Shape_int8_t y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Octagonal_Shape_int8_t p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Octagonal_Shape_int8_t_Iterator **begin_iterator** ()
- native Pointset_Powerset_Octagonal_Shape_int8_t_Iterator **end_iterator** ()
- native void **add_disjunct** (Octagonal_Shape_int8_t j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Octagonal_Shape_int8_t_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Octagonal_Shape_int8_t_Iterator itr1, Pointset_-Powerset_Octagonal_Shape_int8_t_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_Octagonal_Shape_int8-_t y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_Octagonal_Shape_int8_t y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.128.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int8_t> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_int8_t.java

## 10.129 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_int8_t_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int8_t> >:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_int8_t_Iterator** (Pointset_Powerset_Octagonal_Shape_int8_t_Iterator y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_int8_t_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Octagonal_Shape_int8_t **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.129.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<int8_t> >:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_int8_t_Iterator.java

## 10.130 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_long_double Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<long double> >

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_long_double** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Octagonal_Shape_long_double** (Pointset_Powerset_Octagonal_Shape_long_double y)
- **Pointset_Powerset_Octagonal_Shape_long_double** (Octagonal_Shape_long_double y)
- **Pointset_Powerset_Octagonal_Shape_long_double** (Pointset_Powerset_Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_long_double** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_long_double** (Constraint_System cs)
- **Pointset_Powerset_Octagonal_Shape_long_double** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Octagonal_Shape_long_double y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Octagonal_Shape_long_double y)
- native boolean **strictly_contains** (Pointset_Powerset_Octagonal_Shape_long_double y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Octagonal_Shape_long_double y)
- native boolean **geometrically_covers** (Pointset_Powerset_Octagonal_Shape_long_double y)
- native boolean **geometrically_equals** (Pointset_Powerset_Octagonal_Shape_long_double y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_long_double p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)

- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Octagonal_Shape_long_double p)
- native void **upper_bound_assign** (Pointset_Powerset_Octagonal_Shape_long_double p)
- native void **difference_assign** (Pointset_Powerset_Octagonal_Shape_long_double p)
- native void **concatenate_assign** (Pointset_Powerset_Octagonal_Shape_long_double p)
- native void **time_elapse_assign** (Pointset_Powerset_Octagonal_Shape_long_double p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Octagonal_Shape_long_double y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Octagonal_Shape_long_double p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Octagonal_Shape_long_double_Iterator **begin_iterator** ()
- native Pointset_Powerset_Octagonal_Shape_long_double_Iterator **end_iterator** ()
- native void **add_disjunct** (Octagonal_Shape_long_double j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Octagonal_Shape_long_double_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Octagonal_Shape_long_double_Iterator itr1, Pointset-_Powerset_Octagonal_Shape_long_double_Iterator itr2)

- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_Octagonal_Shape_long_double y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_Octagonal_Shape_long_double y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.130.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<long double> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_long_double.java

## 10.131 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_long_double_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<long double> >:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_long_double_Iterator** (Pointset_Powerset_Octagonal_Shape_long_double_Iterator y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_long_double_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Octagonal_Shape_long_double **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.131.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<long double> >:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_long_double_Iterator.java

## 10.132 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_mpq_class Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<mpq_class> >

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_mpq_class** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Octagonal_Shape_mpq_class** (Pointset_Powerset_Octagonal_Shape_mpq_class y)
- **Pointset_Powerset_Octagonal_Shape_mpq_class** (Octagonal_Shape_mpq_class y)
- **Pointset_Powerset_Octagonal_Shape_mpq_class** (Pointset_Powerset_Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_mpq_class** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_mpq_class** (Constraint_System cs)
- **Pointset_Powerset_Octagonal_Shape_mpq_class** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Octagonal_Shape_mpq_class y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Octagonal_Shape_mpq_class y)
- native boolean **strictly_contains** (Pointset_Powerset_Octagonal_Shape_mpq_class y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Octagonal_Shape_mpq_class y)
- native boolean **geometrically_covers** (Pointset_Powerset_Octagonal_Shape_mpq_class y)
- native boolean **geometrically_equals** (Pointset_Powerset_Octagonal_Shape_mpq_class y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_mpq_class p)

- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Octagonal_Shape_mpq_class p)
- native void **upper_bound_assign** (Pointset_Powerset_Octagonal_Shape_mpq_class p)
- native void **difference_assign** (Pointset_Powerset_Octagonal_Shape_mpq_class p)
- native void **concatenate_assign** (Pointset_Powerset_Octagonal_Shape_mpq_class p)
- native void **time_elapse_assign** (Pointset_Powerset_Octagonal_Shape_mpq_class p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Octagonal_Shape_mpq_class y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Octagonal_Shape_mpq_class p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Octagonal_Shape_mpq_class_Iterator **begin_iterator** ()
- native Pointset_Powerset_Octagonal_Shape_mpq_class_Iterator **end_iterator** ()

- native void **add_disjunct** (Octagonal_Shape_mpq_class j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Octagonal_Shape_mpq_class_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Octagonal_Shape_mpq_class_Iterator itr1, Pointset_Powerset_Octagonal_Shape_mpq_class_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_Octagonal_Shape_mpq_class y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_Octagonal_Shape_mpq_class y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.132.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<mpq_class> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_mpq_class.java

## 10.133 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_mpq_class_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<mpq_class> >:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_mpq_class_Iterator** (Pointset_Powerset_Octagonal_Shape_mpq_class_Iterator y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_mpq_class_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Octagonal_Shape_mpq_class **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.133.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<mpq_class> >:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_mpq_class_Iterator.java

## 10.134 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_mpz_class Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<mpz_class> >

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_mpz_class** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Octagonal_Shape_mpz_class** (Pointset_Powerset_Octagonal_Shape_mpz_class y)
- **Pointset_Powerset_Octagonal_Shape_mpz_class** (Octagonal_Shape_mpz_class y)
- **Pointset_Powerset_Octagonal_Shape_mpz_class** (Pointset_Powerset_Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_mpz_class** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Pointset_Powerset_Octagonal_Shape_mpz_class** (Constraint_System cs)
- **Pointset_Powerset_Octagonal_Shape_mpz_class** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Octagonal_Shape_mpz_class y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)

- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Octagonal_Shape_mpz_class y)
- native boolean **strictly_contains** (Pointset_Powerset_Octagonal_Shape_mpz_class y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Octagonal_Shape_mpz_class y)
- native boolean **geometrically_covers** (Pointset_Powerset_Octagonal_Shape_mpz_class y)
- native boolean **geometrically_equals** (Pointset_Powerset_Octagonal_Shape_mpz_class y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_mpz_class p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Octagonal_Shape_mpz_class p)
- native void **upper_bound_assign** (Pointset_Powerset_Octagonal_Shape_mpz_class p)
- native void **difference_assign** (Pointset_Powerset_Octagonal_Shape_mpz_class p)
- native void **concatenate_assign** (Pointset_Powerset_Octagonal_Shape_mpz_class p)
- native void **time_elapse_assign** (Pointset_Powerset_Octagonal_Shape_mpz_class p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Octagonal_Shape_mpz_class y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Octagonal_Shape_mpz_class p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)

- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Octagonal_Shape_mpz_class_Iterator **begin_iterator** ()
- native Pointset_Powerset_Octagonal_Shape_mpz_class_Iterator **end_iterator** ()
- native void **add_disjunct** (Octagonal_Shape_mpz_class j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Octagonal_Shape_mpz_class_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Octagonal_Shape_mpz_class_Iterator itr1, Pointset_Powerset_Octagonal_Shape_mpz_class_Iterator itr2)
- native void **BHZ03_H79_BHMZ05_widening_assign** (Pointset_Powerset_Octagonal_Shape_mpz_class y)
- native void **BGP99_BHMZ05_extrapolation_assign** (Pointset_Powerset_Octagonal_Shape_mpz_class y, Integer d)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.134.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<mpz_class> >

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_mpz_class.java

## 10.135 parma_polyhedra_library.Pointset_Powerset_Octagonal_Shape_mpz_class_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<mpz_class> >:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Octagonal_Shape_mpz_class_Iterator** (Pointset_Powerset_Octagonal_Shape_mpz_class_Iterator y)
- native boolean **equals** (Pointset_Powerset_Octagonal_Shape_mpz_class_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Octagonal_Shape_mpz_class **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.135.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Octagonal_Shape<mpz_class> >:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Octagonal_Shape_mpz_class_Iterator.java

## 10.136 parma_polyhedra_library.Pointset_Powerset_Rational_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Rational_Box>

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Rational_Box** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Rational_Box** (Pointset_Powerset_Rational_Box y)
- **Pointset_Powerset_Rational_Box** (Rational_Box y)
- **Pointset_Powerset_Rational_Box** (Pointset_Powerset_Rational_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Rational_Box** (Rational_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Rational_Box** (Constraint_System cs)
- **Pointset_Powerset_Rational_Box** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Rational_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)

- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Rational_Box y)
- native boolean **strictly_contains** (Pointset_Powerset_Rational_Box y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Rational_Box y)
- native boolean **geometrically_covers** (Pointset_Powerset_Rational_Box y)
- native boolean **geometrically_equals** (Pointset_Powerset_Rational_Box y)
- native boolean **equals** (Pointset_Powerset_Rational_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Rational_Box p)
- native void **upper_bound_assign** (Pointset_Powerset_Rational_Box p)
- native void **difference_assign** (Pointset_Powerset_Rational_Box p)
- native void **concatenate_assign** (Pointset_Powerset_Rational_Box p)
- native void **time_elapse_assign** (Pointset_Powerset_Rational_Box p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Rational_Box y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Rational_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)

- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Rational_Box_Iterator **begin_iterator** ()
- native Pointset_Powerset_Rational_Box_Iterator **end_iterator** ()
- native void **add_disjunct** (Rational_Box j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Rational_Box_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Rational_Box_Iterator itr1, Pointset_Powerset_Rational_Box_Iterator itr2)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.136.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Rational_Box>

The documentation for this class was generated from the following file:

- Pointset_Powerset_Rational_Box.java

## 10.137 parma_polyhedra_library.Pointset_Powerset_Rational_Box_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Rational_Box>:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Rational_Box_Iterator** (Pointset_Powerset_Rational_Box_Iterator y)
- native boolean **equals** (Pointset_Powerset_Rational_Box_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Rational_Box **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.137.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Rational_Box>:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Rational_Box_Iterator.java

## 10.138 parma_polyhedra_library.Pointset_Powerset_Uint16_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint16_Box>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Uint16_Box** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Uint16_Box** (Pointset_Powerset_Uint16_Box y)
- **Pointset_Powerset_Uint16_Box** (Uint16_Box y)
- **Pointset_Powerset_Uint16_Box** (Pointset_Powerset_Uint16_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Uint16_Box** (Uint16_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Uint16_Box** (Constraint_System cs)
- **Pointset_Powerset_Uint16_Box** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Uint16_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Uint16_Box y)
- native boolean **strictly_contains** (Pointset_Powerset_Uint16_Box y)

- native boolean **is_disjoint_from** (Pointset_Powerset_Uint16_Box y)
- native boolean **geometrically_covers** (Pointset_Powerset_Uint16_Box y)
- native boolean **geometrically_equals** (Pointset_Powerset_Uint16_Box y)
- native boolean **equals** (Pointset_Powerset_Uint16_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Uint16_Box p)
- native void **upper_bound_assign** (Pointset_Powerset_Uint16_Box p)
- native void **difference_assign** (Pointset_Powerset_Uint16_Box p)
- native void **concatenate_assign** (Pointset_Powerset_Uint16_Box p)
- native void **time_elapse_assign** (Pointset_Powerset_Uint16_Box p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Uint16_Box y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Uint16_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()

- native long **size** ()
- native Pointset_Powerset_Uint16_Box_Iterator **begin_iterator** ()
- native Pointset_Powerset_Uint16_Box_Iterator **end_iterator** ()
- native void **add_disjunct** (Uint16_Box j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Uint16_Box_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Uint16_Box_Iterator itr1, Pointset_Powerset_Uint16_Box_Iterator itr2)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.138.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint16_Box>

The documentation for this class was generated from the following file:

- Pointset_Powerset_Uint16_Box.java

## 10.139 parma_polyhedra_library.Pointset_Powerset_Uint16_Box_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint16_Box>:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Uint16_Box_Iterator** (Pointset_Powerset_Uint16_Box_Iterator y)
- native boolean **equals** (Pointset_Powerset_Uint16_Box_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Uint16_Box **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.139.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint16_Box>:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Uint16_Box_Iterator.java

## 10.140 parma_polyhedra_library.Pointset_Powerset_Uint32_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint32_Box>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Uint32_Box** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Uint32_Box** (Pointset_Powerset_Uint32_Box y)
- **Pointset_Powerset_Uint32_Box** (Uint32_Box y)
- **Pointset_Powerset_Uint32_Box** (Pointset_Powerset_Uint32_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Uint32_Box** (Uint32_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Uint32_Box** (Constraint_System cs)
- **Pointset_Powerset_Uint32_Box** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Uint32_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Uint32_Box y)
- native boolean **strictly_contains** (Pointset_Powerset_Uint32_Box y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Uint32_Box y)
- native boolean **geometrically_covers** (Pointset_Powerset_Uint32_Box y)
- native boolean **geometrically_equals** (Pointset_Powerset_Uint32_Box y)
- native boolean **equals** (Pointset_Powerset_Uint32_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)

- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Uint32_Box p)
- native void **upper_bound_assign** (Pointset_Powerset_Uint32_Box p)
- native void **difference_assign** (Pointset_Powerset_Uint32_Box p)
- native void **concatenate_assign** (Pointset_Powerset_Uint32_Box p)
- native void **time_elapse_assign** (Pointset_Powerset_Uint32_Box p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Uint32_Box y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Uint32_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Uint32_Box_Iterator **begin_iterator** ()
- native Pointset_Powerset_Uint32_Box_Iterator **end_iterator** ()
- native void **add_disjunct** (Uint32_Box j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Uint32_Box_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Uint32_Box_Iterator itr1, Pointset_Powerset_Uint32_Box_Iterator itr2)

- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.140.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint32_Box>

The documentation for this class was generated from the following file:

- Pointset_Powerset_Uint32_Box.java

## 10.141 parma_polyhedra_library.Pointset_Powerset_Uint32_Box_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint32_Box>:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Uint32_Box_Iterator** (Pointset_Powerset_Uint32_Box_Iterator y)
- native boolean **equals** (Pointset_Powerset_Uint32_Box_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Uint32_Box **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.141.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint32_Box>:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Uint32_Box_Iterator.java

## 10.142 parma_polyhedra_library.Pointset_Powerset_Uint64_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint64_Box>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Uint64_Box** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Uint64_Box** (Pointset_Powerset_Uint64_Box y)
- **Pointset_Powerset_Uint64_Box** (Uint64_Box y)
- **Pointset_Powerset_Uint64_Box** (Pointset_Powerset_Uint64_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Uint64_Box** (Uint64_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Uint64_Box** (Constraint_System cs)
- **Pointset_Powerset_Uint64_Box** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Uint64_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Uint64_Box y)
- native boolean **strictly_contains** (Pointset_Powerset_Uint64_Box y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Uint64_Box y)
- native boolean **geometrically_covers** (Pointset_Powerset_Uint64_Box y)
- native boolean **geometrically_equals** (Pointset_Powerset_Uint64_Box y)
- native boolean **equals** (Pointset_Powerset_Uint64_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)

- native void **intersection_assign** (Pointset_Powerset_Uint64_Box p)
- native void **upper_bound_assign** (Pointset_Powerset_Uint64_Box p)
- native void **difference_assign** (Pointset_Powerset_Uint64_Box p)
- native void **concatenate_assign** (Pointset_Powerset_Uint64_Box p)
- native void **time_elapse_assign** (Pointset_Powerset_Uint64_Box p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Uint64_Box y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Uint64_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Uint64_Box_Iterator **begin_iterator** ()
- native Pointset_Powerset_Uint64_Box_Iterator **end_iterator** ()
- native void **add_disjunct** (Uint64_Box j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Uint64_Box_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Uint64_Box_Iterator itr1, Pointset_Powerset_Uint64-_Box_Iterator itr2)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.142.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint64_Box>

The documentation for this class was generated from the following file:

- Pointset_Powerset_Uint64_Box.java

## 10.143 parma_polyhedra_library.Pointset_Powerset_Uint64_Box_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint64_Box>:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Uint64_Box_Iterator** (Pointset_Powerset_Uint64_Box_Iterator y)
- native boolean **equals** (Pointset_Powerset_Uint64_Box_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Uint64_Box **get_disjunct** ()
- native void **free** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.143.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint64_Box>:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Uint64_Box_Iterator.java

## 10.144 parma_polyhedra_library.Pointset_Powerset_Uint8_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint8_Box>

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Pointset_Powerset_Uint8_Box** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Uint8_Box** (Pointset_Powerset_Uint8_Box y)
- **Pointset_Powerset_Uint8_Box** (Uint8_Box y)

- **Pointset_Powerset_Uint8_Box** (Pointset_Powerset_Uint8_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Uint8_Box** (Uint8_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Uint8_Box** (Constraint_System cs)
- **Pointset_Powerset_Uint8_Box** (Congruence_System cs)
- native void **swap** (Pointset_Powerset_Uint8_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Uint8_Box y)
- native boolean **strictly_contains** (Pointset_Powerset_Uint8_Box y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Uint8_Box y)
- native boolean **geometrically_covers** (Pointset_Powerset_Uint8_Box y)
- native boolean **geometrically_equals** (Pointset_Powerset_Uint8_Box y)
- native boolean **equals** (Pointset_Powerset_Uint8_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Uint8_Box p)
- native void **upper_bound_assign** (Pointset_Powerset_Uint8_Box p)
- native void **difference_assign** (Pointset_Powerset_Uint8_Box p)
- native void **concatenate_assign** (Pointset_Powerset_Uint8_Box p)
- native void **time_elapse_assign** (Pointset_Powerset_Uint8_Box p)

- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Uint8_Box y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Uint8_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Uint8_Box_Iterator **begin_iterator** ()
- native Pointset_Powerset_Uint8_Box_Iterator **end_iterator** ()
- native void **add_disjunct** (Uint8_Box j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Uint8_Box_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Uint8_Box_Iterator itr1, Pointset_Powerset_Uint8-_Box_Iterator itr2)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Protected Member Functions

- native void **finalize** ()

### 10.144.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint8_Box>

The documentation for this class was generated from the following file:

- Pointset_Powerset_Uint8_Box.java

## 10.145 parma_polyhedra_library.Pointset_Powerset_Uint8_Box_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint8_Box>:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Uint8_Box_Iterator** (Pointset_Powerset_Uint8_Box_Iterator y)
- native boolean **equals** (Pointset_Powerset_Uint8_Box_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Uint8_Box **get_disjunct** ()
- native void **free** ()

### Protected Member Functions

- native void **finalize** ()

### 10.145.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Uint8_Box>:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Uint8_Box_Iterator.java

## 10.146 parma_polyhedra_library.Pointset_Powerset_Z_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Z_Box>

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Z_Box** (long num_dimensions, Degenerate_Element kind)
- **Pointset_Powerset_Z_Box** (Pointset_Powerset_Z_Box y)
- **Pointset_Powerset_Z_Box** (Z_Box y)
- **Pointset_Powerset_Z_Box** (Pointset_Powerset_Z_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Z_Box** (Z_Box y, Complexity_Class complexity)
- **Pointset_Powerset_Z_Box** (Constraint_System cs)
- **Pointset_Powerset_Z_Box** (Congruence_System cs)

- native void **swap** (Pointset_Powerset_Z_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native void **pairwise_reduce** ()
- native void **omega_reduce** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **contains** (Pointset_Powerset_Z_Box y)
- native boolean **strictly_contains** (Pointset_Powerset_Z_Box y)
- native boolean **is_disjoint_from** (Pointset_Powerset_Z_Box y)
- native boolean **geometrically_covers** (Pointset_Powerset_Z_Box y)
- native boolean **geometrically_equals** (Pointset_Powerset_Z_Box y)
- native boolean **equals** (Pointset_Powerset_Z_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Pointset_Powerset_Z_Box p)
- native void **upper_bound_assign** (Pointset_Powerset_Z_Box p)
- native void **difference_assign** (Pointset_Powerset_Z_Box p)
- native void **concatenate_assign** (Pointset_Powerset_Z_Box p)
- native void **time_elapse_assign** (Pointset_Powerset_Z_Box p)
- native boolean **upper_bound_assign_if_exact** (Pointset_Powerset_Z_Box y)
- native boolean **simplify_using_context_assign** (Pointset_Powerset_Z_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)

- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native long **size** ()
- native Pointset_Powerset_Z_Box_Iterator **begin_iterator** ()
- native Pointset_Powerset_Z_Box_Iterator **end_iterator** ()
- native void **add_disjunct** (Z_Box j_disj)
- native void **drop_disjunct** (Pointset_Powerset_Z_Box_Iterator itr)
- native void **drop_disjuncts** (Pointset_Powerset_Z_Box_Iterator itr1, Pointset_Powerset_Z_Box_Iterator itr2)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Protected Member Functions

- native void **finalize** ()

### 10.146.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Z_Box>

The documentation for this class was generated from the following file:

- Pointset_Powerset_Z_Box.java

## 10.147 parma_polyhedra_library.Pointset_Powerset_Z_Box_Iterator Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Z_Box>:: iterator.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Pointset_Powerset_Z_Box_Iterator** (Pointset_Powerset_Z_Box_Iterator y)
- native boolean **equals** (Pointset_Powerset_Z_Box_Iterator itr)
- native void **next** ()
- native void **prev** ()
- native Z_Box **get_disjunct** ()
- native void **free** ()

### Protected Member Functions

- native void **finalize** ()

### 10.147.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Pointset_Powerset<Z_Box>:: iterator.

The documentation for this class was generated from the following file:

- Pointset_Powerset_Z_Box_Iterator.java

## 10.148 parma_polyhedra_library.Poly_Con_Relation Class Reference

The relation between a polyhedron and a constraint.

### Public Member Functions

- Poly_Con_Relation (int val)

  *Constructs from a integer value.*
- boolean implies (Poly_Con_Relation y)

  *True if and only if* `this` *implies* `y`.

### Static Public Member Functions

- static Poly_Con_Relation nothing ()

  *The assertion that says nothing.*
- static Poly_Con_Relation is_disjoint ()

  *The polyhedron and the set of points satisfying the constraint are disjoint.*
- static Poly_Con_Relation strictly_intersects ()

  *The polyhedron intersects the set of points satisfying the constraint, but it is not included in it.*
- static Poly_Con_Relation is_included ()

  *The polyhedron is included in the set of points satisfying the constraint.*
- static Poly_Con_Relation saturates ()

  *The polyhedron is included in the set of points saturating the constraint.*

#### Static Public Attributes

- static final int **NOTHING** = 0
- static final int **IS_DISJOINT** = 1
- static final int **STRICTLY_INTERSECTS** = 2
- static final int **IS_INCLUDED** = 4
- static final int **SATURATES** = 8

### 10.148.1 Detailed Description

The relation between a polyhedron and a constraint.

This class implements conjunctions of assertions on the relation between a polyhedron and a constraint.

The documentation for this class was generated from the following file:

- Poly_Con_Relation.java

## 10.149 parma_polyhedra_library.Poly_Gen_Relation Class Reference

The relation between a polyhedron and a generator.

#### Public Member Functions

- Poly_Gen_Relation (int val)

  *Constructs from a integer value.*
- boolean implies (Poly_Gen_Relation y)

  *True if and only if `this` implies `y`.*

#### Static Public Member Functions

- static Poly_Gen_Relation nothing ()

  *The assertion that says nothing.*
- static Poly_Gen_Relation subsumes ()

  *Adding the generator would not change the polyhedron.*

#### Static Public Attributes

- static final int **NOTHING** = 0
- static final int **SUBSUMES** = 1

### 10.149.1 Detailed Description

The relation between a polyhedron and a generator.

This class implements conjunctions of assertions on the relation between a polyhedron and a generator.

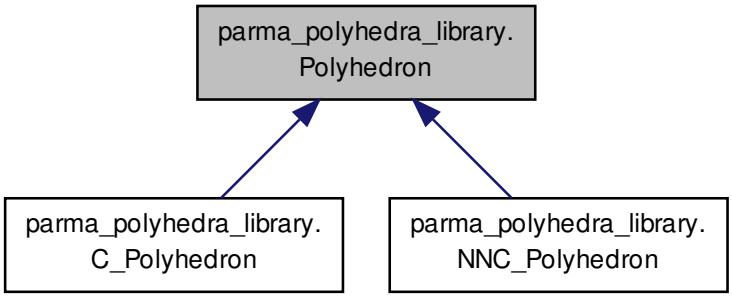
The documentation for this class was generated from the following file:

- Poly_Gen_Relation.java

## 10.150 parma_polyhedra_library.Polyhedron Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Polyhedron.

Inheritance diagram for parma_polyhedra_library.Polyhedron:




### Public Member Functions

- native void **swap** (Polyhedron y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Generator_System **generators** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native Generator_System **minimized_generators** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)

- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Polyhedron y)
- native boolean **strictly_contains** (Polyhedron y)
- native boolean **is_disjoint_from** (Polyhedron y)
- native boolean **equals** (Polyhedron p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_generator** (Generator c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **add_generators** (Generator_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Polyhedron p)
- native void **upper_bound_assign** (Polyhedron p)
- native void **difference_assign** (Polyhedron p)
- native void **concatenate_assign** (Polyhedron p)
- native void **time_elapse_assign** (Polyhedron p)
- native void **poly_hull_assign** (Polyhedron p)
- native void **poly_difference_assign** (Polyhedron p)
- native boolean **simplify_using_context_assign** (Polyhedron p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)

- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **BHRZ03_widening_assign** (Polyhedron y, By_Reference< Integer > tp)
- native void **H79_widening_assign** (Polyhedron y, By_Reference< Integer > tp)
- native void **widening_assign** (Polyhedron y, By_Reference< Integer > tp)
- native void **limited_BHRZ03_extrapolation_assign** (Polyhedron y, Constraint_System cs, By_Reference< Integer > tp)
- native void **bounded_BHRZ03_extrapolation_assign** (Polyhedron y, Constraint_System cs, By_Reference< Integer > tp)
- native void **limited_H79_extrapolation_assign** (Polyhedron y, Constraint_System cs, By_Reference< Integer > tp)
- native void **bounded_H79_extrapolation_assign** (Polyhedron y, Constraint_System cs, By_Reference< Integer > tp)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native int **hashCode** ()
- native String **toString** ()

#### Additional Inherited Members

### 10.150.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Polyhedron.

The documentation for this class was generated from the following file:

- Polyhedron.java

## 10.151 parma_polyhedra_library.Rational_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Rational_Box.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Rational_Box** (long num_dimensions, Degenerate_Element kind)
- **Rational_Box** (Int8_Box y)
- **Rational_Box** (Int16_Box y)
- **Rational_Box** (Int32_Box y)
- **Rational_Box** (Int64_Box y)
- **Rational_Box** (Uint8_Box y)
- **Rational_Box** (Uint16_Box y)
- **Rational_Box** (Uint32_Box y)

- **Rational_Box** (Uint64_Box y)
- **Rational_Box** (Z_Box y)
- **Rational_Box** (Rational_Box y)
- **Rational_Box** (BD_Shape_int8_t y)
- **Rational_Box** (BD_Shape_int16_t y)
- **Rational_Box** (BD_Shape_int32_t y)
- **Rational_Box** (BD_Shape_int64_t y)
- **Rational_Box** (BD_Shape_mpz_class y)
- **Rational_Box** (BD_Shape_mpq_class y)
- **Rational_Box** (Octagonal_Shape_int8_t y)
- **Rational_Box** (Octagonal_Shape_int16_t y)
- **Rational_Box** (Octagonal_Shape_int32_t y)
- **Rational_Box** (Octagonal_Shape_int64_t y)
- **Rational_Box** (Octagonal_Shape_mpz_class y)
- **Rational_Box** (Octagonal_Shape_mpq_class y)
- **Rational_Box** (C_Polyhedron y)
- **Rational_Box** (NNC_Polyhedron y)
- **Rational_Box** (Grid y)
- **Rational_Box** (Float_Box y)
- **Rational_Box** (BD_Shape_float y)
- **Rational_Box** (Octagonal_Shape_float y)
- **Rational_Box** (Double_Box y)
- **Rational_Box** (BD_Shape_double y)
- **Rational_Box** (Octagonal_Shape_double y)
- **Rational_Box** (Long_Double_Box y)
- **Rational_Box** (BD_Shape_long_double y)
- **Rational_Box** (Octagonal_Shape_long_double y)
- **Rational_Box** (Int8_Box y, Complexity_Class complexity)
- **Rational_Box** (Int16_Box y, Complexity_Class complexity)
- **Rational_Box** (Int32_Box y, Complexity_Class complexity)
- **Rational_Box** (Int64_Box y, Complexity_Class complexity)
- **Rational_Box** (Uint8_Box y, Complexity_Class complexity)
- **Rational_Box** (Uint16_Box y, Complexity_Class complexity)
- **Rational_Box** (Uint32_Box y, Complexity_Class complexity)
- **Rational_Box** (Uint64_Box y, Complexity_Class complexity)
- **Rational_Box** (Z_Box y, Complexity_Class complexity)
- **Rational_Box** (Rational_Box y, Complexity_Class complexity)
- **Rational_Box** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Rational_Box** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Rational_Box** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Rational_Box** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Rational_Box** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Rational_Box** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Rational_Box** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Rational_Box** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Rational_Box** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Rational_Box** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Rational_Box** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Rational_Box** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Rational_Box** (C_Polyhedron y, Complexity_Class complexity)

- **Rational_Box** (NNC_Polyhedron y, Complexity_Class complexity)
- **Rational_Box** (Grid y, Complexity_Class complexity)
- **Rational_Box** (Float_Box y, Complexity_Class complexity)
- **Rational_Box** (BD_Shape_float y, Complexity_Class complexity)
- **Rational_Box** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Rational_Box** (Double_Box y, Complexity_Class complexity)
- **Rational_Box** (BD_Shape_double y, Complexity_Class complexity)
- **Rational_Box** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Rational_Box** (Long_Double_Box y, Complexity_Class complexity)
- **Rational_Box** (BD_Shape_long_double y, Complexity_Class complexity)
- **Rational_Box** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Rational_Box** (Constraint_System cs)
- **Rational_Box** (Congruence_System cs)
- **Rational_Box** (Generator_System cs)
- native void **swap** (Rational_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **has_upper_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)
- native boolean **has_lower_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Rational_Box y)
- native boolean **strictly_contains** (Rational_Box y)
- native boolean **is_disjoint_from** (Rational_Box y)
- native boolean **equals** (Rational_Box p)

- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Rational_Box p)
- native void **upper_bound_assign** (Rational_Box p)
- native void **difference_assign** (Rational_Box p)
- native void **concatenate_assign** (Rational_Box p)
- native void **time_elapse_assign** (Rational_Box p)
- native boolean **upper_bound_assign_if_exact** (Rational_Box y)
- native boolean **simplify_using_context_assign** (Rational_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **CC76_widening_assign** (Rational_Box y, By_Reference< Integer > tp)
- native void **widening_assign** (Rational_Box y, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Rational_Box y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Rational_Box arg)

- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair < Rational_Box, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Rational_Box p, Rational_Box q)

#### Protected Member Functions

- native void **finalize** ()

### 10.151.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Rational_Box.

The documentation for this class was generated from the following file:

- Rational_Box.java

## 10.152 parma_polyhedra_library.Relation_Symbol Enum Reference

Relation symbols.

#### Static Public Member Functions

- **[static initializer]**

#### Public Attributes

- LESS_THAN

  *Less than.*
- LESS_OR_EQUAL

  *Less than or equal to.*
- EQUAL

  *Equal to.*
- GREATER_OR_EQUAL

  *Greater than or equal to.*

### 10.152.1 Detailed Description

Relation symbols.

The documentation for this enum was generated from the following file:

- Relation_Symbol.java

## 10.153 parma_polyhedra_library.Timeout_Exception Class Reference

Exceptions caused by timeout expiring.

### Public Member Functions

- Timeout_Exception (String s)
  *Constructor.*

### 10.153.1 Detailed Description

Exceptions caused by timeout expiring.

The documentation for this class was generated from the following file:

- Timeout_Exception.java

## 10.154 parma_polyhedra_library.Uint16_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Uint16_Box.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Uint16_Box** (long num_dimensions, Degenerate_Element kind)
- **Uint16_Box** (Int8_Box y)
- **Uint16_Box** (Int16_Box y)
- **Uint16_Box** (Int32_Box y)
- **Uint16_Box** (Int64_Box y)
- **Uint16_Box** (Uint8_Box y)
- **Uint16_Box** (Uint16_Box y)
- **Uint16_Box** (Uint32_Box y)
- **Uint16_Box** (Uint64_Box y)
- **Uint16_Box** (Z_Box y)
- **Uint16_Box** (Rational_Box y)
- **Uint16_Box** (BD_Shape_int8_t y)
- **Uint16_Box** (BD_Shape_int16_t y)
- **Uint16_Box** (BD_Shape_int32_t y)
- **Uint16_Box** (BD_Shape_int64_t y)
- **Uint16_Box** (BD_Shape_mpz_class y)
- **Uint16_Box** (BD_Shape_mpq_class y)

- **Uint16_Box** (Octagonal_Shape_int8_t y)
- **Uint16_Box** (Octagonal_Shape_int16_t y)
- **Uint16_Box** (Octagonal_Shape_int32_t y)
- **Uint16_Box** (Octagonal_Shape_int64_t y)
- **Uint16_Box** (Octagonal_Shape_mpz_class y)
- **Uint16_Box** (Octagonal_Shape_mpq_class y)
- **Uint16_Box** (C_Polyhedron y)
- **Uint16_Box** (NNC_Polyhedron y)
- **Uint16_Box** (Grid y)
- **Uint16_Box** (Float_Box y)
- **Uint16_Box** (BD_Shape_float y)
- **Uint16_Box** (Octagonal_Shape_float y)
- **Uint16_Box** (Double_Box y)
- **Uint16_Box** (BD_Shape_double y)
- **Uint16_Box** (Octagonal_Shape_double y)
- **Uint16_Box** (Long_Double_Box y)
- **Uint16_Box** (BD_Shape_long_double y)
- **Uint16_Box** (Octagonal_Shape_long_double y)
- **Uint16_Box** (Int8_Box y, Complexity_Class complexity)
- **Uint16_Box** (Int16_Box y, Complexity_Class complexity)
- **Uint16_Box** (Int32_Box y, Complexity_Class complexity)
- **Uint16_Box** (Int64_Box y, Complexity_Class complexity)
- **Uint16_Box** (Uint8_Box y, Complexity_Class complexity)
- **Uint16_Box** (Uint16_Box y, Complexity_Class complexity)
- **Uint16_Box** (Uint32_Box y, Complexity_Class complexity)
- **Uint16_Box** (Uint64_Box y, Complexity_Class complexity)
- **Uint16_Box** (Z_Box y, Complexity_Class complexity)
- **Uint16_Box** (Rational_Box y, Complexity_Class complexity)
- **Uint16_Box** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Uint16_Box** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Uint16_Box** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Uint16_Box** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Uint16_Box** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Uint16_Box** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Uint16_Box** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Uint16_Box** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Uint16_Box** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Uint16_Box** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Uint16_Box** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Uint16_Box** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Uint16_Box** (C_Polyhedron y, Complexity_Class complexity)
- **Uint16_Box** (NNC_Polyhedron y, Complexity_Class complexity)
- **Uint16_Box** (Grid y, Complexity_Class complexity)
- **Uint16_Box** (Float_Box y, Complexity_Class complexity)
- **Uint16_Box** (BD_Shape_float y, Complexity_Class complexity)
- **Uint16_Box** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Uint16_Box** (Double_Box y, Complexity_Class complexity)
- **Uint16_Box** (BD_Shape_double y, Complexity_Class complexity)
- **Uint16_Box** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Uint16_Box** (Long_Double_Box y, Complexity_Class complexity)

- **Uint16_Box** (BD_Shape_long_double y, Complexity_Class complexity)
- **Uint16_Box** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Uint16_Box** (Constraint_System cs)
- **Uint16_Box** (Congruence_System cs)
- **Uint16_Box** (Generator_System cs)
- native void **swap** (Uint16_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **has_upper_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)
- native boolean **has_lower_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Uint16_Box y)
- native boolean **strictly_contains** (Uint16_Box y)
- native boolean **is_disjoint_from** (Uint16_Box y)
- native boolean **equals** (Uint16_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)

- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Uint16_Box p)
- native void **upper_bound_assign** (Uint16_Box p)
- native void **difference_assign** (Uint16_Box p)
- native void **concatenate_assign** (Uint16_Box p)
- native void **time_elapse_assign** (Uint16_Box p)
- native boolean **upper_bound_assign_if_exact** (Uint16_Box y)
- native boolean **simplify_using_context_assign** (Uint16_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **CC76_widening_assign** (Uint16_Box y, By_Reference< Integer > tp)
- native void **widening_assign** (Uint16_Box y, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Uint16_Box y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Uint16_Box arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_-Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity-_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair< Uint16_Box, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Uint16_Box p, Uint16_Box q)

#### Protected Member Functions

- native void **finalize** ()

### 10.154.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Uint16_Box.

The documentation for this class was generated from the following file:

- Uint16_Box.java

## 10.155 parma_polyhedra_library.Uint32_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Uint32_Box.

Inherits parma_polyhedra_library.PPL_Object.

#### Public Member Functions

- **Uint32_Box** (long num_dimensions, Degenerate_Element kind)
- **Uint32_Box** (Int8_Box y)
- **Uint32_Box** (Int16_Box y)
- **Uint32_Box** (Int32_Box y)
- **Uint32_Box** (Int64_Box y)
- **Uint32_Box** (Uint8_Box y)
- **Uint32_Box** (Uint16_Box y)
- **Uint32_Box** (Uint32_Box y)
- **Uint32_Box** (Uint64_Box y)
- **Uint32_Box** (Z_Box y)
- **Uint32_Box** (Rational_Box y)
- **Uint32_Box** (BD_Shape_int8_t y)
- **Uint32_Box** (BD_Shape_int16_t y)
- **Uint32_Box** (BD_Shape_int32_t y)
- **Uint32_Box** (BD_Shape_int64_t y)
- **Uint32_Box** (BD_Shape_mpz_class y)
- **Uint32_Box** (BD_Shape_mpq_class y)
- **Uint32_Box** (Octagonal_Shape_int8_t y)
- **Uint32_Box** (Octagonal_Shape_int16_t y)
- **Uint32_Box** (Octagonal_Shape_int32_t y)
- **Uint32_Box** (Octagonal_Shape_int64_t y)
- **Uint32_Box** (Octagonal_Shape_mpz_class y)
- **Uint32_Box** (Octagonal_Shape_mpq_class y)
- **Uint32_Box** (C_Polyhedron y)
- **Uint32_Box** (NNC_Polyhedron y)

- **Uint32_Box** (Grid y)
- **Uint32_Box** (Float_Box y)
- **Uint32_Box** (BD_Shape_float y)
- **Uint32_Box** (Octagonal_Shape_float y)
- **Uint32_Box** (Double_Box y)
- **Uint32_Box** (BD_Shape_double y)
- **Uint32_Box** (Octagonal_Shape_double y)
- **Uint32_Box** (Long_Double_Box y)
- **Uint32_Box** (BD_Shape_long_double y)
- **Uint32_Box** (Octagonal_Shape_long_double y)
- **Uint32_Box** (Int8_Box y, Complexity_Class complexity)
- **Uint32_Box** (Int16_Box y, Complexity_Class complexity)
- **Uint32_Box** (Int32_Box y, Complexity_Class complexity)
- **Uint32_Box** (Int64_Box y, Complexity_Class complexity)
- **Uint32_Box** (Uint8_Box y, Complexity_Class complexity)
- **Uint32_Box** (Uint16_Box y, Complexity_Class complexity)
- **Uint32_Box** (Uint32_Box y, Complexity_Class complexity)
- **Uint32_Box** (Uint64_Box y, Complexity_Class complexity)
- **Uint32_Box** (Z_Box y, Complexity_Class complexity)
- **Uint32_Box** (Rational_Box y, Complexity_Class complexity)
- **Uint32_Box** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Uint32_Box** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Uint32_Box** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Uint32_Box** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Uint32_Box** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Uint32_Box** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Uint32_Box** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Uint32_Box** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Uint32_Box** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Uint32_Box** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Uint32_Box** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Uint32_Box** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Uint32_Box** (C_Polyhedron y, Complexity_Class complexity)
- **Uint32_Box** (NNC_Polyhedron y, Complexity_Class complexity)
- **Uint32_Box** (Grid y, Complexity_Class complexity)
- **Uint32_Box** (Float_Box y, Complexity_Class complexity)
- **Uint32_Box** (BD_Shape_float y, Complexity_Class complexity)
- **Uint32_Box** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Uint32_Box** (Double_Box y, Complexity_Class complexity)
- **Uint32_Box** (BD_Shape_double y, Complexity_Class complexity)
- **Uint32_Box** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Uint32_Box** (Long_Double_Box y, Complexity_Class complexity)
- **Uint32_Box** (BD_Shape_long_double y, Complexity_Class complexity)
- **Uint32_Box** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Uint32_Box** (Constraint_System cs)
- **Uint32_Box** (Congruence_System cs)
- **Uint32_Box** (Generator_System cs)
- native void **swap** (Uint32_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()

- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **has_upper_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)
- native boolean **has_lower_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Uint32_Box y)
- native boolean **strictly_contains** (Uint32_Box y)
- native boolean **is_disjoint_from** (Uint32_Box y)
- native boolean **equals** (Uint32_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Uint32_Box p)
- native void **upper_bound_assign** (Uint32_Box p)
- native void **difference_assign** (Uint32_Box p)
- native void **concatenate_assign** (Uint32_Box p)
- native void **time_elapse_assign** (Uint32_Box p)
- native boolean **upper_bound_assign_if_exact** (Uint32_Box y)
- native boolean **simplify_using_context_assign** (Uint32_Box p)

- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_-Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear-_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **CC76_widening_assign** (Uint32_Box y, By_Reference< Integer > tp)
- native void **widening_assign** (Uint32_Box y, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Uint32_Box y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Uint32_Box arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_-Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity-_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Static Public Member Functions

- static native Pair< Uint32_Box, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Uint32_Box p, Uint32_Box q)

### Protected Member Functions

- native void **finalize** ()

### 10.155.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Uint32_Box.

The documentation for this class was generated from the following file:

- Uint32_Box.java

## 10.156 parma_polyhedra_library.Uint64_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Uint64_Box.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Uint64_Box** (long num_dimensions, Degenerate_Element kind)
- **Uint64_Box** (Int8_Box y)
- **Uint64_Box** (Int16_Box y)
- **Uint64_Box** (Int32_Box y)
- **Uint64_Box** (Int64_Box y)
- **Uint64_Box** (Uint8_Box y)
- **Uint64_Box** (Uint16_Box y)
- **Uint64_Box** (Uint32_Box y)
- **Uint64_Box** (Uint64_Box y)
- **Uint64_Box** (Z_Box y)
- **Uint64_Box** (Rational_Box y)
- **Uint64_Box** (BD_Shape_int8_t y)
- **Uint64_Box** (BD_Shape_int16_t y)
- **Uint64_Box** (BD_Shape_int32_t y)
- **Uint64_Box** (BD_Shape_int64_t y)
- **Uint64_Box** (BD_Shape_mpz_class y)
- **Uint64_Box** (BD_Shape_mpq_class y)
- **Uint64_Box** (Octagonal_Shape_int8_t y)
- **Uint64_Box** (Octagonal_Shape_int16_t y)
- **Uint64_Box** (Octagonal_Shape_int32_t y)
- **Uint64_Box** (Octagonal_Shape_int64_t y)
- **Uint64_Box** (Octagonal_Shape_mpz_class y)
- **Uint64_Box** (Octagonal_Shape_mpq_class y)
- **Uint64_Box** (C_Polyhedron y)
- **Uint64_Box** (NNC_Polyhedron y)
- **Uint64_Box** (Grid y)
- **Uint64_Box** (Float_Box y)
- **Uint64_Box** (BD_Shape_float y)
- **Uint64_Box** (Octagonal_Shape_float y)
- **Uint64_Box** (Double_Box y)
- **Uint64_Box** (BD_Shape_double y)
- **Uint64_Box** (Octagonal_Shape_double y)
- **Uint64_Box** (Long_Double_Box y)
- **Uint64_Box** (BD_Shape_long_double y)
- **Uint64_Box** (Octagonal_Shape_long_double y)

- **Uint64_Box** (Int8_Box y, Complexity_Class complexity)
- **Uint64_Box** (Int16_Box y, Complexity_Class complexity)
- **Uint64_Box** (Int32_Box y, Complexity_Class complexity)
- **Uint64_Box** (Int64_Box y, Complexity_Class complexity)
- **Uint64_Box** (Uint8_Box y, Complexity_Class complexity)
- **Uint64_Box** (Uint16_Box y, Complexity_Class complexity)
- **Uint64_Box** (Uint32_Box y, Complexity_Class complexity)
- **Uint64_Box** (Uint64_Box y, Complexity_Class complexity)
- **Uint64_Box** (Z_Box y, Complexity_Class complexity)
- **Uint64_Box** (Rational_Box y, Complexity_Class complexity)
- **Uint64_Box** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Uint64_Box** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Uint64_Box** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Uint64_Box** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Uint64_Box** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Uint64_Box** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Uint64_Box** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Uint64_Box** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Uint64_Box** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Uint64_Box** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Uint64_Box** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Uint64_Box** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Uint64_Box** (C_Polyhedron y, Complexity_Class complexity)
- **Uint64_Box** (NNC_Polyhedron y, Complexity_Class complexity)
- **Uint64_Box** (Grid y, Complexity_Class complexity)
- **Uint64_Box** (Float_Box y, Complexity_Class complexity)
- **Uint64_Box** (BD_Shape_float y, Complexity_Class complexity)
- **Uint64_Box** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Uint64_Box** (Double_Box y, Complexity_Class complexity)
- **Uint64_Box** (BD_Shape_double y, Complexity_Class complexity)
- **Uint64_Box** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Uint64_Box** (Long_Double_Box y, Complexity_Class complexity)
- **Uint64_Box** (BD_Shape_long_double y, Complexity_Class complexity)
- **Uint64_Box** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Uint64_Box** (Constraint_System cs)
- **Uint64_Box** (Congruence_System cs)
- **Uint64_Box** (Generator_System cs)
- native void **swap** (Uint64_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()

- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **has_upper_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)
- native boolean **has_lower_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Uint64_Box y)
- native boolean **strictly_contains** (Uint64_Box y)
- native boolean **is_disjoint_from** (Uint64_Box y)
- native boolean **equals** (Uint64_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Uint64_Box p)
- native void **upper_bound_assign** (Uint64_Box p)
- native void **difference_assign** (Uint64_Box p)
- native void **concatenate_assign** (Uint64_Box p)
- native void **time_elapse_assign** (Uint64_Box p)
- native boolean **upper_bound_assign_if_exact** (Uint64_Box y)
- native boolean **simplify_using_context_assign** (Uint64_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)

- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)
- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **CC76_widening_assign** (Uint64_Box y, By_Reference< Integer > tp)
- native void **widening_assign** (Uint64_Box y, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Uint64_Box y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Uint64_Box arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

### Static Public Member Functions

- static native Pair< Uint64_Box, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Uint64_Box p, Uint64_Box q)

### Protected Member Functions

- native void **finalize** ()

### 10.156.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Uint64_Box.

The documentation for this class was generated from the following file:

- Uint64_Box.java

## 10.157 parma_polyhedra_library.Uint8_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Uint8_Box.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Uint8_Box** (long num_dimensions, Degenerate_Element kind)
- **Uint8_Box** (Int8_Box y)
- **Uint8_Box** (Int16_Box y)
- **Uint8_Box** (Int32_Box y)
- **Uint8_Box** (Int64_Box y)
- **Uint8_Box** (Uint8_Box y)
- **Uint8_Box** (Uint16_Box y)
- **Uint8_Box** (Uint32_Box y)
- **Uint8_Box** (Uint64_Box y)
- **Uint8_Box** (Z_Box y)
- **Uint8_Box** (Rational_Box y)
- **Uint8_Box** (BD_Shape_int8_t y)
- **Uint8_Box** (BD_Shape_int16_t y)
- **Uint8_Box** (BD_Shape_int32_t y)
- **Uint8_Box** (BD_Shape_int64_t y)
- **Uint8_Box** (BD_Shape_mpz_class y)
- **Uint8_Box** (BD_Shape_mpq_class y)
- **Uint8_Box** (Octagonal_Shape_int8_t y)
- **Uint8_Box** (Octagonal_Shape_int16_t y)
- **Uint8_Box** (Octagonal_Shape_int32_t y)
- **Uint8_Box** (Octagonal_Shape_int64_t y)
- **Uint8_Box** (Octagonal_Shape_mpz_class y)
- **Uint8_Box** (Octagonal_Shape_mpq_class y)
- **Uint8_Box** (C_Polyhedron y)
- **Uint8_Box** (NNC_Polyhedron y)
- **Uint8_Box** (Grid y)
- **Uint8_Box** (Float_Box y)
- **Uint8_Box** (BD_Shape_float y)
- **Uint8_Box** (Octagonal_Shape_float y)
- **Uint8_Box** (Double_Box y)
- **Uint8_Box** (BD_Shape_double y)
- **Uint8_Box** (Octagonal_Shape_double y)
- **Uint8_Box** (Long_Double_Box y)
- **Uint8_Box** (BD_Shape_long_double y)
- **Uint8_Box** (Octagonal_Shape_long_double y)
- **Uint8_Box** (Int8_Box y, Complexity_Class complexity)
- **Uint8_Box** (Int16_Box y, Complexity_Class complexity)
- **Uint8_Box** (Int32_Box y, Complexity_Class complexity)
- **Uint8_Box** (Int64_Box y, Complexity_Class complexity)
- **Uint8_Box** (Uint8_Box y, Complexity_Class complexity)
- **Uint8_Box** (Uint16_Box y, Complexity_Class complexity)
- **Uint8_Box** (Uint32_Box y, Complexity_Class complexity)
- **Uint8_Box** (Uint64_Box y, Complexity_Class complexity)

- **Uint8_Box** (Z_Box y, Complexity_Class complexity)
- **Uint8_Box** (Rational_Box y, Complexity_Class complexity)
- **Uint8_Box** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Uint8_Box** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Uint8_Box** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Uint8_Box** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Uint8_Box** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Uint8_Box** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Uint8_Box** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Uint8_Box** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Uint8_Box** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Uint8_Box** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Uint8_Box** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Uint8_Box** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Uint8_Box** (C_Polyhedron y, Complexity_Class complexity)
- **Uint8_Box** (NNC_Polyhedron y, Complexity_Class complexity)
- **Uint8_Box** (Grid y, Complexity_Class complexity)
- **Uint8_Box** (Float_Box y, Complexity_Class complexity)
- **Uint8_Box** (BD_Shape_float y, Complexity_Class complexity)
- **Uint8_Box** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Uint8_Box** (Double_Box y, Complexity_Class complexity)
- **Uint8_Box** (BD_Shape_double y, Complexity_Class complexity)
- **Uint8_Box** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Uint8_Box** (Long_Double_Box y, Complexity_Class complexity)
- **Uint8_Box** (BD_Shape_long_double y, Complexity_Class complexity)
- **Uint8_Box** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Uint8_Box** (Constraint_System cs)
- **Uint8_Box** (Congruence_System cs)
- **Uint8_Box** (Generator_System cs)
- native void **swap** (Uint8_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **has_upper_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)

- native boolean **has_lower_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_Reference< Boolean > closed)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Uint8_Box y)
- native boolean **strictly_contains** (Uint8_Box y)
- native boolean **is_disjoint_from** (Uint8_Box y)
- native boolean **equals** (Uint8_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Uint8_Box p)
- native void **upper_bound_assign** (Uint8_Box p)
- native void **difference_assign** (Uint8_Box p)
- native void **concatenate_assign** (Uint8_Box p)
- native void **time_elapse_assign** (Uint8_Box p)
- native boolean **upper_bound_assign_if_exact** (Uint8_Box y)
- native boolean **simplify_using_context_assign** (Uint8_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)

- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **CC76_widening_assign** (Uint8_Box y, By_Reference< Integer > tp)
- native void **widening_assign** (Uint8_Box y, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Uint8_Box y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Uint8_Box arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair< Uint8_Box, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Uint8_Box p, Uint8_Box q)

#### Protected Member Functions

- native void **finalize** ()

### 10.157.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Uint8_Box.

The documentation for this class was generated from the following file:

- Uint8_Box.java

## 10.158 parma_polyhedra_library.Variable Class Reference

A dimension of the vector space.

#### Public Member Functions

- Variable (int i)

  *Builds the variable corresponding to the Cartesian axis of index* `i`.
- int id ()

  *Returns the index of the Cartesian axis associated to* `this`.
- int compareTo (Variable v)

  *Returns a negative number if* `this` *comes first than* `v`*, a zero if* `this` *equals* `v`*, a positive number if if* `this` *comes first than* `v`.

### 10.158.1 Detailed Description

A dimension of the vector space.

An object of the class Variable represents a dimension of the space, that is one of the Cartesian axes. Variables are used as basic blocks in order to build more complex linear expressions. Each variable is identified by a non-negative integer, representing the index of the corresponding Cartesian axis (the first axis has index 0).

### 10.158.2 Constructor & Destructor Documentation

#### 10.158.2.1 parma_polyhedra_library.Variable.Variable ( int *i* ) [inline]

Builds the variable corresponding to the Cartesian axis of index `i`.

#### Exceptions

| | |
|---|---|
| *RuntimeErrorException* | Thrown if `i` is has negative value. |

The documentation for this class was generated from the following file:

- Variable.java

## 10.159 parma_polyhedra_library.Variables_Set Class Reference

A java.util.TreeSet of variables' indexes.

#### Public Member Functions

- Variables_Set ()

  *Builds the empty set of variable indexes.*

### 10.159.1 Detailed Description

A java.util.TreeSet of variables' indexes.

The documentation for this class was generated from the following file:

- Variables_Set.java

## 10.160 parma_polyhedra_library.Z_Box Class Reference

Java class interfacing C++ Parma_Polyhedra_Library::Z_Box.

Inherits parma_polyhedra_library.PPL_Object.

### Public Member Functions

- **Z_Box** (long num_dimensions, Degenerate_Element kind)
- **Z_Box** (Int8_Box y)
- **Z_Box** (Int16_Box y)
- **Z_Box** (Int32_Box y)
- **Z_Box** (Int64_Box y)
- **Z_Box** (Uint8_Box y)
- **Z_Box** (Uint16_Box y)
- **Z_Box** (Uint32_Box y)
- **Z_Box** (Uint64_Box y)
- **Z_Box** (Z_Box y)
- **Z_Box** (Rational_Box y)
- **Z_Box** (BD_Shape_int8_t y)
- **Z_Box** (BD_Shape_int16_t y)
- **Z_Box** (BD_Shape_int32_t y)
- **Z_Box** (BD_Shape_int64_t y)
- **Z_Box** (BD_Shape_mpz_class y)
- **Z_Box** (BD_Shape_mpq_class y)
- **Z_Box** (Octagonal_Shape_int8_t y)
- **Z_Box** (Octagonal_Shape_int16_t y)
- **Z_Box** (Octagonal_Shape_int32_t y)
- **Z_Box** (Octagonal_Shape_int64_t y)
- **Z_Box** (Octagonal_Shape_mpz_class y)
- **Z_Box** (Octagonal_Shape_mpq_class y)
- **Z_Box** (C_Polyhedron y)
- **Z_Box** (NNC_Polyhedron y)
- **Z_Box** (Grid y)
- **Z_Box** (Float_Box y)
- **Z_Box** (BD_Shape_float y)
- **Z_Box** (Octagonal_Shape_float y)
- **Z_Box** (Double_Box y)
- **Z_Box** (BD_Shape_double y)
- **Z_Box** (Octagonal_Shape_double y)
- **Z_Box** (Long_Double_Box y)
- **Z_Box** (BD_Shape_long_double y)
- **Z_Box** (Octagonal_Shape_long_double y)
- **Z_Box** (Int8_Box y, Complexity_Class complexity)
- **Z_Box** (Int16_Box y, Complexity_Class complexity)
- **Z_Box** (Int32_Box y, Complexity_Class complexity)
- **Z_Box** (Int64_Box y, Complexity_Class complexity)
- **Z_Box** (Uint8_Box y, Complexity_Class complexity)
- **Z_Box** (Uint16_Box y, Complexity_Class complexity)
- **Z_Box** (Uint32_Box y, Complexity_Class complexity)
- **Z_Box** (Uint64_Box y, Complexity_Class complexity)

- **Z_Box** (Z_Box y, Complexity_Class complexity)
- **Z_Box** (Rational_Box y, Complexity_Class complexity)
- **Z_Box** (BD_Shape_int8_t y, Complexity_Class complexity)
- **Z_Box** (BD_Shape_int16_t y, Complexity_Class complexity)
- **Z_Box** (BD_Shape_int32_t y, Complexity_Class complexity)
- **Z_Box** (BD_Shape_int64_t y, Complexity_Class complexity)
- **Z_Box** (BD_Shape_mpz_class y, Complexity_Class complexity)
- **Z_Box** (BD_Shape_mpq_class y, Complexity_Class complexity)
- **Z_Box** (Octagonal_Shape_int8_t y, Complexity_Class complexity)
- **Z_Box** (Octagonal_Shape_int16_t y, Complexity_Class complexity)
- **Z_Box** (Octagonal_Shape_int32_t y, Complexity_Class complexity)
- **Z_Box** (Octagonal_Shape_int64_t y, Complexity_Class complexity)
- **Z_Box** (Octagonal_Shape_mpz_class y, Complexity_Class complexity)
- **Z_Box** (Octagonal_Shape_mpq_class y, Complexity_Class complexity)
- **Z_Box** (C_Polyhedron y, Complexity_Class complexity)
- **Z_Box** (NNC_Polyhedron y, Complexity_Class complexity)
- **Z_Box** (Grid y, Complexity_Class complexity)
- **Z_Box** (Float_Box y, Complexity_Class complexity)
- **Z_Box** (BD_Shape_float y, Complexity_Class complexity)
- **Z_Box** (Octagonal_Shape_float y, Complexity_Class complexity)
- **Z_Box** (Double_Box y, Complexity_Class complexity)
- **Z_Box** (BD_Shape_double y, Complexity_Class complexity)
- **Z_Box** (Octagonal_Shape_double y, Complexity_Class complexity)
- **Z_Box** (Long_Double_Box y, Complexity_Class complexity)
- **Z_Box** (BD_Shape_long_double y, Complexity_Class complexity)
- **Z_Box** (Octagonal_Shape_long_double y, Complexity_Class complexity)
- **Z_Box** (Constraint_System cs)
- **Z_Box** (Congruence_System cs)
- **Z_Box** (Generator_System cs)
- native void **swap** (Z_Box y)
- native long **space_dimension** ()
- native long **affine_dimension** ()
- native Poly_Con_Relation **relation_with** (Constraint c)
- native Poly_Gen_Relation **relation_with** (Generator c)
- native Poly_Con_Relation **relation_with** (Congruence c)
- native Constraint_System **constraints** ()
- native Congruence_System **congruences** ()
- native Constraint_System **minimized_constraints** ()
- native Congruence_System **minimized_congruences** ()
- native boolean **is_empty** ()
- native boolean **is_universe** ()
- native boolean **is_bounded** ()
- native boolean **contains_integer_point** ()
- native boolean **is_topologically_closed** ()
- native boolean **is_discrete** ()
- native void **topological_closure_assign** ()
- native boolean **bounds_from_above** (Linear_Expression expr)
- native boolean **bounds_from_below** (Linear_Expression expr)
- native boolean **has_upper_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_-Reference< Boolean > closed)

- native boolean **has_lower_bound** (Variable var, Coefficient bound_n, Coefficient bound_d, By_Reference< Boolean > closed)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum)
- native boolean **maximize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **minimize** (Linear_Expression expr, Coefficient sup_n, Coefficient sup_d, By_Reference< Boolean > maximum, Generator point)
- native boolean **frequency** (Linear_Expression expr, Coefficient freq_n, Coefficient freq_d, Coefficient val_n, Coefficient val_d)
- native boolean **contains** (Z_Box y)
- native boolean **strictly_contains** (Z_Box y)
- native boolean **is_disjoint_from** (Z_Box y)
- native boolean **equals** (Z_Box p)
- boolean **equals** (Object y)
- native boolean **OK** ()
- native void **add_constraint** (Constraint c)
- native void **add_congruence** (Congruence c)
- native void **add_constraints** (Constraint_System c)
- native void **add_congruences** (Congruence_System c)
- native void **refine_with_constraint** (Constraint c)
- native void **refine_with_congruence** (Congruence c)
- native void **refine_with_constraints** (Constraint_System c)
- native void **refine_with_congruences** (Congruence_System c)
- native void **intersection_assign** (Z_Box p)
- native void **upper_bound_assign** (Z_Box p)
- native void **difference_assign** (Z_Box p)
- native void **concatenate_assign** (Z_Box p)
- native void **time_elapse_assign** (Z_Box p)
- native boolean **upper_bound_assign_if_exact** (Z_Box y)
- native boolean **simplify_using_context_assign** (Z_Box p)
- native boolean **constrains** (Variable var)
- native void **unconstrain_space_dimension** (Variable var)
- native void **unconstrain_space_dimensions** (Variables_Set vars)
- native void **affine_image** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **affine_preimage** (Variable var, Linear_Expression expr, Coefficient denominator)
- native void **bounded_affine_image** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **bounded_affine_preimage** (Variable var, Linear_Expression lb_expr, Linear_Expression ub_expr, Coefficient denominator)
- native void **generalized_affine_image** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_preimage** (Variable var, Relation_Symbol relsym, Linear_Expression expr, Coefficient denominator)
- native void **generalized_affine_image** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **generalized_affine_preimage** (Linear_Expression lhs, Relation_Symbol relsym, Linear_Expression rhs)
- native void **add_space_dimensions_and_embed** (long m)

- native void **add_space_dimensions_and_project** (long m)
- native void **remove_space_dimensions** (Variables_Set vars)
- native void **remove_higher_space_dimensions** (long new_dimension)
- native void **expand_space_dimension** (Variable var, long m)
- native void **fold_space_dimensions** (Variables_Set vars, Variable dest)
- native void **map_space_dimensions** (Partial_Function pfunc)
- native void **drop_some_non_integer_points** (Integer complexity_threshold)
- native void **drop_some_non_integer_points_2** (Variables_Set vars, Integer complexity_threshold)
- native String **ascii_dump** ()
- native long **external_memory_in_bytes** ()
- native long **total_memory_in_bytes** ()
- native void **CC76_widening_assign** (Z_Box y, By_Reference< Integer > tp)
- native void **widening_assign** (Z_Box y, By_Reference< Integer > tp)
- native void **limited_CC76_extrapolation_assign** (Z_Box y, Constraint_System cs, By_Reference< Integer > tp)
- native void **CC76_narrowing_assign** (Z_Box arg)
- native void **wrap_assign** (Variables_Set vars, Bounded_Integer_Type_Width w, Bounded_Integer_Type_Representation r, Bounded_Integer_Type_Overflow o, Constraint_System cs, long complexity_threshold, boolean wrap_individually)
- native void **free** ()
- native int **hashCode** ()
- native String **toString** ()

#### Static Public Member Functions

- static native Pair< Z_Box, Pointset_Powerset_NNC_Polyhedron > **linear_partition** (Z_Box p, Z_Box q)

#### Protected Member Functions

- native void **finalize** ()

### 10.160.1 Detailed Description

Java class interfacing C++ Parma_Polyhedra_Library::Z_Box.

The documentation for this class was generated from the following file:

- Z_Box.java

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